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FROM THE

UNITED STATES NATIONAL HERBARIUM

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GRASSES OF BRITISH GUIANA

By A. S. HITCHCOCK

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PREFACE.

The accompanying paper by Dr. A. S. Hitchcock, systematic agrostologist of the United States Department of Agriculture, is an account of the grasses of British Guiana. It contains a descriptive list of the species, keys to the tribes and genera, a discussion of the distribution of the species according to habitat, and notes on their economic uses. Ten new species are described and all but one illustrated.

The flora is related on the one hand to that of Brazil and on the other to that of the West Indies. A few montane species are found in the region of the famous table mountain, Roraima, but in the main the species are those of the tropical lowlands. The savanna grasses of the southern part of the Colony furnish the basis of an important stock industry.

FREDERICK V. COVILLE,
Curator of the United States National Herbarium.

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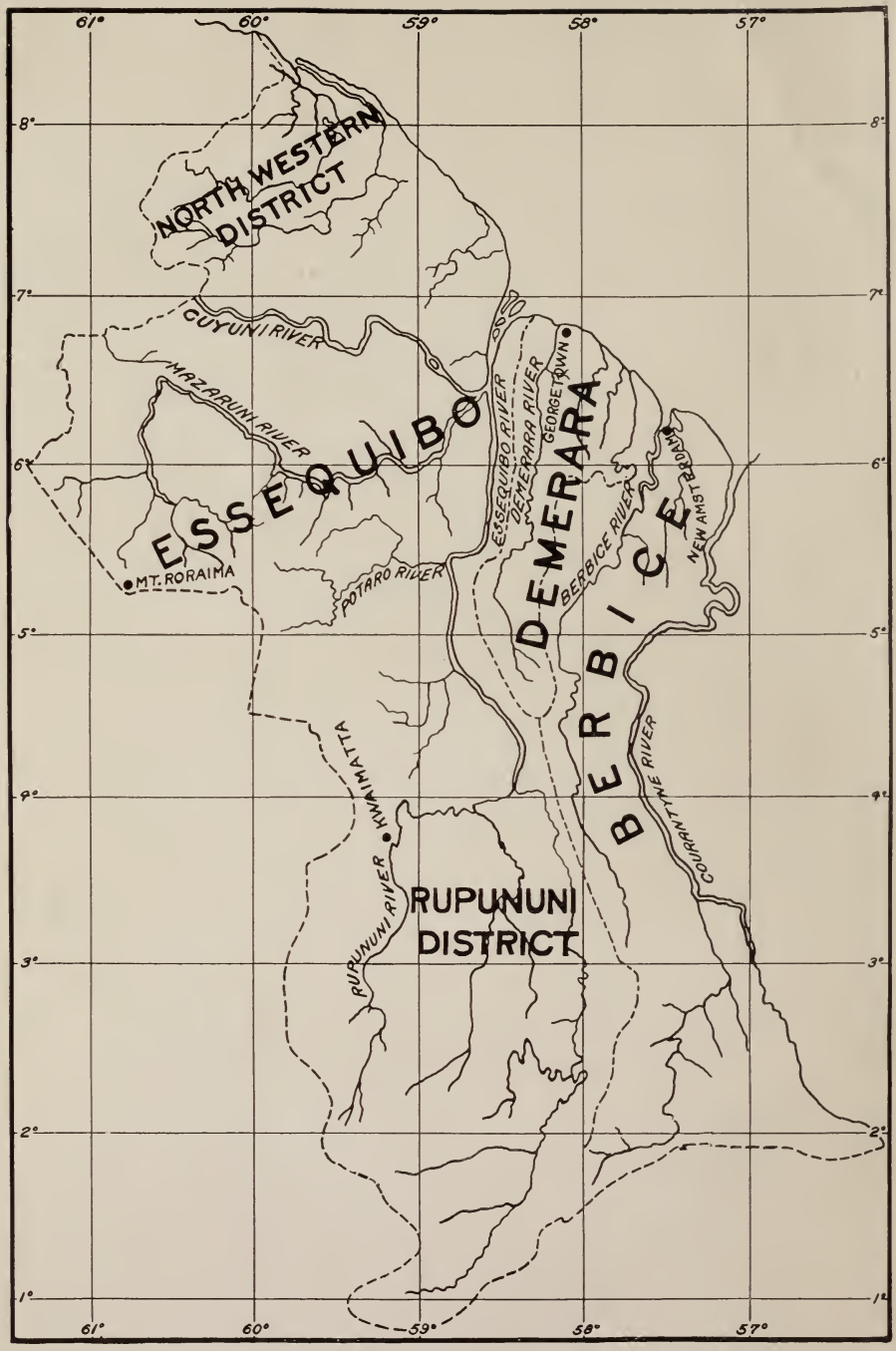

Map of British Guiana.

GRASSES OF BRITISH GUIANA.

By A. S. Hitchcock.

INTRODUCTION.

In the fall of 1919 I visited British Guiana for the purpose of collecting and studying its flora, especially the grasses. The itinerary has been recorded[1] in another place and a brief account of the country and its botanical aspects has also appeared.[2]

The collection of grasses obtained seemed sufficiently representative to warrant the preparation of an account of the grass flora of the Colony. The following paper is based on this collection and also on an important Colonial collection, the Jenman Herbarium. Professor J. B. Harrison, Director of Science and Agriculture, British Guiana, very kindly placed the herbarium at my disposal and allowed me to select for the U. S. National Herbarium a set of duplicates of the grasses.

The Jenman Herbarium is arranged in suitable cases in the office of the Director at the Botanic Gardens, Georgetown. Most of the specimens were collected by Jenman, but there are also collections from Roraima by Im Thurn, and by McConnell and Quelch, and from various parts of the Colony by Bartlett, Stockdale, and occasionally others, all connected at some time with the Department of Science and Agriculture. Mr. G. S. Jenman was the Director of the Botanic Garden for many years. Recently an important collection has been made by Abraham in connection with the cattle trail survey in County Berbice. Before the collections made by the writer were incorporated, there were comparatively few specimens from British Guiana in the U. S. National Herbarium, the most important set being one collected by Schomburgk.

The present list of grasses includes 169 species, nine of which are described as new. The synonymy has been limited to the more important names. Many of the species are also found in the West Indies and a more complete synonymy is included in a recent work dealing with the grasses of that region.[3] Most of the remaining

[1] Journ. N. Y. Bot. Gard. **21**: 129–137. 1920.

[2] Floral Aspects of British Guiana, Ann. Rep. Smiths. Inst. **1919**: 293–305. 1921.

[3] Grasses of the West Indies, Contr. U. S. Nat. Herb. **18**: 261–471. 1917.

species are described in Martius's Flora of Brazil,[4] where synonymy is given.

In the article on the Floral Aspects of British Guiana, cited above, the climatic and topographic features of the country are described.

FIG. 77.—Northern part of British Guiana.

A short résumé here will suffice. From the northern coast line of about 270 miles the Colony extends southward 540 miles on the west-

[4] Doell in Mart. Fl. Bras. Vol. 2^2 and 2^3 (Andropogoneae and Tristegineae by Hackel.)

ern and 300 miles on the eastern side. Along the coast is a belt 10 to 40 miles wide of low, more or less swampy land, covered with forest, with interspersed areas of marshy savannas. Back of this is a broad belt of undulating forest-covered land reaching a maximum elevation of possibly 200 feet. Toward the southwest there is a series of plateaus, also forest-covered, culminating in a range of mountains extending into British Guiana from Venezuela. Here is the famous table mountain, Roraima, rising from the plateau level of 1,050 meters to a height of 2,580 meters. The sides are precipitous and the flat summit of several miles' area is inaccessible except by a shelving ascent on one side.[5]

Most of British Guiana is covered by virgin forest. Only in the south, the Rupununi District, are there extensive upland savannas, an extension eastward of the vast savannas of Venezuela.

Of the 169 species included in the present list 33, or about 20 per cent, are introduced, the greater proportion of these being in the vicinity of settlements. The following are the introduced species:

Eragrostis amabilis. Frequent in gardens.
Eragrostis ciliaris. Infrequent; waste places.
Eragrostis pilosa. Rare.
Eragrostis tephrosanthos. Common in gardens.
Arundo donax. Escaped from cultivation; abundant locally.
Leptochloa filiformis. Frequent in gardens.
Eleusine indica. Common.
Dactyloctenium aegyptium. Rare.
Capriola dactylon. Bahama grass; common.
Chloris radiata. Rare.
Bouteloua americana. Rare.
Valota insularis. Rare.
Syntherisma sanguinalis. Common.
Syntherisma digitata. Common.
Syntherisma chinensis. Common.
Syntherisma longiflora. Rare.
Eriochloa ramosa. Common around Georgetown.
Paspalum fimbriatum. Rare.
Paspalum paniculatum. Infrequent.
Panicum reptans. Infrequent in gardens.
Panicum maximum. Guinea grass; escaped from cultivation; infrequent.

[5] See Trans. Linn. Soc. II. Bot. 6: 2. 1901. The dates of expeditions to Roraima are here given: R. H. Schomburgk, 1838; R. H. and Richard Schomburgk, 1842; Karl Appun, 1864; C. B. Brown and J. G. Sawkins, 1869; J. W. Boddam-Whetham and M. McTurk, 1878; D. Burke, 1881; Siedel, 1884; E. F. Im Thurn and H. I. Perkins, 1884, reaching the summit for the first time; E. Kromer, 1886; Dressel, 1887; F. V. McConnell and J. J. Quelch, 1894 and 1898. Ule made the ascent in 1909.

Panicum barbinode. Pará grass; escaped from cultivation; common.

Echinochloa colonum. Common.

Cenchrus echinatus. Common in grassland and waste places.

Andropogon pertusus panormitanus. This and the following three in grassland of the Botanical Garden:

Andropogon nodosus.

Andropogon annulatus.

Andropogon ischaemum.

Anatherum zizanioides. Khuskhus, vetiver; escaped from cultivation.

Holcus sorghum. Escaped from cultivation; rare.

Holcus sorghum sudanensis. Escaped from cultivation; rare.

Ischaemum ciliare. Frequent inland.

Coix lachryma-jobi. Escaped from cultivation; infrequent.

There are but two distinctly seacoast species, *Sporobolus virginicus* and *Spartina brasiliensis.* A few species are characteristic of sandy soil. An example of sand barrens is found between the Demerara and Essequibo rivers, a section of which is accessible along the railroad between Wismar and Rockstone. This region is similar to the white sand scrub of central Florida. The vegetation is mainly shrubs and small trees with areas of bare white sand between. The characteristic grasses here are *Axonopus attenuatus*, *Gymnopogon foliosus*, and *Paspalum arenarium.* In the sandy savanna back of the East Coast Water Conservancy at the head of Horeabea Creek *Panicum micranthum* was abundant.

The coast savannas, which are open marshy areas, harbor many species of grasses. There is considerable variation in the amount of water in different parts of this coastal area, this affecting the distribution of the grasses. The following is a list of the species found chiefly in the moist or moderately dry parts of the savannas of the coast, but not normally in the ditches and other wet parts of the region:

Gynerium sagittatum. A giant reed. There is a patch near the station at Parika. Infrequent.

Leptochloa scabra. Along ditches. Infrequent.

Leptochloa virgata. Brushy land. Common.

Sporobolus indicus. Common on grassy hills of Central America and the West Indies; found in grassland about Georgetown, possibly introduced here.

Valota laxa. Moist soil. Infrequent.

Stenotaphrum secundatum. Infrequent. In the United States called St. Augustine grass.

Eriochloa subglabra. Rare.

Eriochloa punctata. Common.

Axonopus leptostachyus. Frequent in the vicinity of Bartica.
Paspalum densum. Frequent in marshes.
Paspalum millegrana. Infrequent.
Paspalum virgatum. Common.
Paspalum conjugatum. Sourgrass; common.
Panicum laxum. Common.
Panicum milleflorum. Infrequent, mostly in rather wet places.
Panicum pilosum. Common.
Panicum zizanioides. Frequent.
Panicum glutinosum. Rare.
Panicum altum. Infrequent.
Panicum hirsutum. Rare.
Panicum errabundum. Rare.
Panicum polycomum. Rare.
Panicum parvifolium. Frequent.
Panicum cyanescens. Infrequent.
Panicum nervosum. Rare.
Sacciolepis myuros. Infrequent.
Homolepis isocalycia. Rare.
Isachne polygonoides. Rare.
Echinochloa crusgalli crus-pavonis. Infrequent.
Chaetochloa geniculata. Common in grassland
Imperata brasiliensis. Infrequent.
Imperata contracta. Infrequent.
Andropogon bicornis. Common.
Eriochrysis cayennensis. Rare.
Manisuris guianensis. Rare.
Ischaemum guianense. Infrequent.

There are several grasses of the coastal region that are found more particularly in or near the water. Two of these (*Paspalum repens* and *Panicum elephantipes*) grow in rather deep water, with the foliage often floating on the surface. These often form the basis of floating islands in the rivers. The others are:

Homalocenchrus hexandrus. Common.
Luziola spruceana. Frequent.
Paspalum distichum. Common.
Paspalum vaginatum. Common.
Paspalum orbiculatum. Infrequent.
Panicum geminatum. Common.
Panicum frondescens. Frequent.
Panicum luticola. Rare.
Panicum polygonatum. Rare.
Panicum guianense. Rare.
Panicum megiston. Infrequent.
Sacciolepis striata. Infrequent.

Hymenachne amplexicaulis. Frequent.
Hymenachne auriculata. Frequent.
Echinochloa polystachya. Infrequent.

The flora changes somewhat in the intermediate region back of the coastal belt. On open sandy land here one finds:

Eragrostis maypurensis. Infrequent.
Eragrostis guianensis. Rare.
Sporobolus ciliatus. Infrequent.
Sporobolus aeneus. Infrequent.
Aristida capillaris. Rare.
Syntherisma malacophylla. Rare.
Syntherisma cuyabensis. Rare.
Axonopus capillaris. Frequent.
Axonopus compressus. Common.
Axonopus stragulus. Frequent.
Paspalum multicaule. Common.
Paspalum pumilum. Frequent.
Paspalum pulchellum. Infrequent.
Paspalum decumbens. Frequent.
Paspalum nutans. Frequent.
Paspalum coryphaeum. Infrequent.
Panicum molle. Rare.
Panicum trichoides. Frequent.
Panicum millegrana. Rare.
Panicum stenodes. Infrequent.
Panicum rudgei. Frequent.
Cenchrus dactylolepis. Infrequent.
Raddia nana. Rare.
Raddia malmeana. Rare.
Andropogon virgatus. Infrequent.
Tripsacum latifolium. Rare.

In the upland savannas which form the grazing areas, such as those of the Rupununi District, the species are about the same as those of the Venezuela savannas. Some of the species extend into the dry savannas of Panama and Central America or even to Mexico. The following may be called savanna grasses:

Triodia flaccida. Rare.
Leptochloa domingensis. Rare.
Chloris polydactyla. Rare.
Leptocoryphium lanatum. Common.
Axonopus aureus. Infrequent.
Axonopus scoparius. Rare.
Paspalum carinatum. Rare.
Paspalum serpentinum. Rare.
Paspalum abrahami. Frequent.

Panicum olyroides. Rare.
Ichnanthus ichnodes. Rare.
Lasiacis procerrima. Rare.
Chaetochloa tenax. Infrequent.
Pennisetum setosum. Infrequent.
Arundinella hispida. Frequent.
Andropogon leucostachyus. Frequent.
Andropogon selloanus. Frequent.
Cymbopogon bracteatus. Common.
Heteropogon contortus. Common.
Trachypogon plumosus. Common.
Elyonurus adustus. Common.

Most of the remaining species might be called forest grasses. They grow at the edge of the forest or in somewhat open woods where light penetrates. The following are forest grasses:

Guadua angustifolia. A bamboo; infrequent.
Guadua glomerata. A bamboo; infrequent.
Orthoclada laxa. Infrequent.
Pariana radiciflora. Rare.
Pariana zingiberina. Rare.
Pharus latifolia. Rare.
Pseudechinolaena polystachya. Rare.
Panicum stoloniferum. Infrequent.
Panicum magnum. Infrequent.
Ichnanthus panicoides. On the floor of the virgin forest. Infrequent.
Ichnanthus riedelii. Infrequent.
Ichnanthus axillaris. Common.
Ichnanthus pallens. Common.
Lasiacis ligulata. Frequent in the Northwest District.
Lasiacis sorghoidea. Rare.
Oplismenus hirtellus. Infrequent.
Olyra surinamensis. Frequent.
Olyra micrantha. Infrequent.
Olyra cordifolia. Rare.
Olyra caudata. Rare.
Olyra latifolia. Infrequent.

A few species are, so far as our specimens show, confined in British Guiana to the vicinity of Mount Roraima. These are:

Arundinaria deflexa.
Chusquea linearis.
Cortaderia roraimensis.
Paspalum pectinatum.
Panicum chnoodes.
Panicum eligulatum.

Three species (*Paspalum orbiculatum potaroense*, *Panicum asperifolium*, *P. pilcomayense*) can not be assigned definitely to any of the series mentioned, because of insufficient data.

Only two grasses are cultivated for forage, Guinea grass and Pará grass. Guinea grass (*Panicum maximum*) is commonly cultivated in the drier regions of the tropics, but appears to be rare in British Guiana, probably because it is not so well adapted to the wet soil of the coastal belt as is Pará grass. Pará grass (*Panicum barbinode*) is also commonly cultivated throughout the tropics at low elevations in moist soil, and is the chief forage grass of British Guiana.

The open grassland in the vicinity of the coast consists chiefly of three species: Bahama grass (*Capriola dactylon*, called Bermuda grass in the United States); carpet grass (*Axonopus compressus*); and sourgrass (*Paspalum conjugatum*). This mixture is cut and fed green to donkeys and other animals. The Bahama grass prefers drier land than the other two and is a frequent constituent of lawns. Sourgrass is usually considered an unsatisfactory forage grass, as it is not very palatable, but being mixed with the others must be gathered along with it. The wild grazing grasses of the upland savannas have been referred to in a preceding paragraph.

A few grasses are cultivated for ornament. Several species of bamboos, the reed (*Arundo donax*), pampas-grass (*Cortaderia argentea*), and, probably more commonly than the others, tiger grass, are used in parks and lawns. Tiger grass (*Thysanolaena acarifera* (Trin.) Arn. & Nees; *T. agrostis* Nees) is a robust perennial 2 to 3 meters tall, with broad flat blades, and large panicles of very small spikelets. It grows in large dark green clumps. Khuskhus or vetiver (*Anatherum zizanioides*) is grown as a hedge plant. The aromatic roots are used for screens and mats, giving off a pleasant odor when wet. Jobs-tears (*Coix lacryma-jobi*) is cultivated for the hard oval involucral bracts which are used for beads.

The drawings illustrating the new species were made by Mary Wright Gill, in each case from the type specimen. The figures are at half natural size.

Two early works contain descriptions of the grasses of British Guiana. The identity of the species is given below.

Rudge, Plantarum Guianae Rariorum Icones et Descriptiones, 1805.

Cenchrus marginalis Rudge=*Echinolaena inflexa* (Poir.) Chase.

Paspalum gracile Rudge=*P. repens* Bergius.

Panicum amplexicaule Rudge=*Hymenachne amplexicaule* (Rudge) Nees.

Panicum commelinaefolium Rudge=*Panicum nervosum* Lam.

Panicum scoparium Rudge=*P. rudgei* Roem. & Schult.

Aristida elegans Rudge=*A. capillacea* Lam.

Meyer, Primitiae Florae Essequeboensis, 1818.

Eriochloa kunthii Meyer=*E. punctata* (L.) Desv.

Paspalum conjugatum Willd. [Bergius].

Paspalum platycaule [Poir.]=*Axonopus compressus* (Swartz) Beauv.

Paspalum virgatum Flügge [L.].

Panicum myurum Lam.=*Hymenachne amplexicaulis* (Rudge) Nees.

Panicum fluitans Willd.=*P. geminatum* Forsk.

Panicum velutinum Meyer=*Oplismenus hirtellus* (L.) Beauv.

Panicum crusgalli Willd.=*Echinochloa crusgalli crus-pavonis* (H. B. K.) Hitchc.

Panicum horizontale (Willd.) Meyer=*Syntherisma digitata* (Swartz) Hitchc.

Panicum lineare Willd.=*Syntherisma chinensis* (Nees) Hitchc.

Panicum frondescens Meyer.

Panicum pilisparsum Meyer=*P. pilosum* Swartz.

Panicum tenuiculme Meyer=*P. laxum* Swartz.

Panicum isocalycium Meyer=*Homolepis isocalycia* (Meyer) Chase.

Panicum insulare Meyer=*Valota insularis* (L.) Chase.

Panicum glutinosum Lam.=*Lasiacis ligulata* Hitchc. & Chase.

Panicum altissimum Meyer=*P. megiston* Schult.

Cenchrus echinatus Vahl. [L.].

Saccharum officinarum Willd. [L.].

Saccharum caudatum Meyer=*Imperata contracta* (H. B. K.) Hitchc.

Andropogon bicornis Willd. [L.].

Leptostachys virgata Meyer=*Leptochloa virgata* (L.) Beauv.

Eleusine indica Michx. [(L.) Gaertn.].

Poa ciliaris Willd. [L.]=*Eragrostis ciliaris* (L.) Link.

Schomburgk[6] gives a list of species without descriptions. The identity of the species can be determined only by consulting the collections at the British Museum.

DESCRIPTIVE LIST, WITH KEYS.

KEY TO THE TRIBES.[7]

Series 1. POATAE.

Spikelets 1 to many-flowered, the reduced florets, if any, above the perfect florets (1 or 2 sterile lemmas below in Bamboseae); articulation usually above the glumes.

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[6] Versuch einer Fauna und Flora von Britisch-Guiana. 1848.

[7] The sequence of genera is that of The Genera of Grasses of the United States, by A. S. Hitchcock (U. S. Dept. Agr. Bull. 772. 1920).

Plants woody, arborescent or clambering; spikelets 1 to many-flowered, 1 to several sterile lemmas below the perfect ones----------1. **BAMBOSEAE.**
Plants herbaceous (somewhat woody in *Arundo*).
Spikelets articulate below the glumes, 1-flowered, either much compressed, or, if not, then unisexual, never in dense spikes; glumes often reduced, sometimes wanting.
Spikelets perfect----------6. **ORYZEAE.**
Spikelets unisexual; plants monoecious----------7. **ZIZANIEAE.**
Spikelets articulate above the glumes (except in *Spartina* and *Orthoclada*).
Spikelets sessile on a continuous rachis, forming spikes (short-pedicellate in *Leptochloa*).
Spikelets on opposite sides of the rachis; spike terminal, single.
3. **HORDEAE.**
Spikelets on one side of the rachis; spikes usually more than 1, digitate or racemose----------4. **CHLORIDEAE.**
Spikelets pedicellate in open or contracted panicles.
Spikelets 1-flowered; leaf blades never broad and net-veined.
5. **AGROSTIDEAE.**
Spikelets 2 to many-flowered (often reduced to 1 floret and a prolonged rachilla joint in *Orthoclada*, this with net-veined blades).
2. **FESTUCEAE.**

Series 2. PANICATAE.

Spikelets with 1 perfect terminal floret (disregarding the few monoecious genera and the staminate and neuter spikelets) and a sterile or staminate floret below, usually represented by a sterile lemma only, one glume sometimes, rarely both glumes, wanting; articulation below the spikelets, either in the pedicel, in the rachis, or at the base of a cluster of spikelets, the spikelets falling entire, either singly, in groups, or together with joints of the rachis; spikelets, or at least the fruits, more or less dorsally compressed.

Glumes indurate; fertile lemma and palea hyaline or membranaceous, the sterile lemma like the fertile one in texture.
Inflorescence not monoecious, the fertile spikelets perfect, each usually paired with a sterile spikelet----------.10. **ANDROPOGONEAE.**
Inflorescence monoecious, the pistillate spikelets below, the staminate above on the same rachis----------11. **TRIPSACEAE.**
Glumes membranaceous; fertile lemma and palea indurate or at least as firm as the glumes; sterile lemma like the glumes in texture.
Fertile lemma and palea scarcely firmer than the glumes--8. **MELINIDEAE.**
Fertile lemma and palea indurate or subindurate, usually much firmer than the glumes----------9. **PANICEAE.**

KEY TO THE GENERA.

1. BAMBOSEAE.

Stamens 6; spikelets several-flowered----------3. **Guadua.**
Stamens 3.
Spikelets few to several-flowered----------1. **Arundinaria.**
Spikelets 1-flowered----------2. **Chusquea.**

2. FESTUCEAE.

Spikelets not long-hairy.
Blades broad, elliptic; spikelets falling entire; lemmas finely several-nerved.
5. **Orthoclada.**

Blades linear; glumes persistent; lemmas 3-nerved.
Nerves of lemma glabrous----4. Eragrostis.
Nerves of lemma pubescent----9. Triodia.
Spikelets (at least the pistillate) with copious long silky hairs on the lemmas or the rachilla.
Spikelets perfect; lemmas hairy; rachilla glabrous----6. Arundo.
Spikelets unisexual; pistillate spikelets hairy, the staminate glabrous or hairy. Plants dioecious.
Culm very tall, short-jointed, the sheaths conspicuously imbricate (the blades commonly fallen from the lower sheaths); staminate spikelets glabrous, the panicle very different in appearance from that of the pistillate spikelets----7. Gynerium.
Culm with long joints, the sheaths not closely imbricate, the plants densely leafy at the base; staminate spikelets hairy, the panicle resembling that of the pistillate spikelets----8. Cortaderia.

3. HORDEAE.

A single genus, of doubtful affinity, in British Guiana----10. Pariana.

4. CHLORIDEAE.

Spikes racemosely arranged.
Spikes appressed. A maritime grass with stout rhizomes----15. Spartina.
Spikes spreading.
Spikes short and numerous----18. Bouteloua.
Spikes long and slender----11. Leptochloa.
Spikes digitate or approximate.
Spikelets with 2 or more perfect florets.
Rachis extending beyond the spikelets----13. Dactyloctenium.
Rachis not extending beyond the spikelets----12. Eleusine.
Spikelets with 1 perfect floret only.
Sterile floret wanting; lemma obtuse----14. Capriola.
Sterile floret present; lemma awned or mucronate.
Leaves scattered along the culm, short; spikes approximate but not digitate----16. Gymnopogon.
Leaves mostly basal; spikes digitate----17. Chloris.

5. AGROSTIDEAE.

Spikelets awnless----19. Sporobolus.
Spikelets awned----20. Aristida.

6. ORYZEAE.

Glumes present, small; lemmas awned----21. Oryza.
Glumes wanting; lemmas awnless----22. Homalocenchrus.

7. ZIZANIEAE.

Blades narrowly linear----23. Luziola.
Blades broad, oblanceolate-oblong----24. Pharus.

8. MELINIDEAE.

A single genus in British Guiana----25. Arundinella.

9. PANICEAE.

Spikelets unisexual. Plants monoecious.
Plants tall; blades mostly more than 2 cm. wide---47. Olyra.
Plants low; blades less than 1 cm. wide---48. Raddia.
Spikelets perfect.
Axis thickened and corky, the spikelets sunken in cavities in its joints, these disarticulating at maturity---29. Stenotaphrum.
Axis not thickened, the spikelets not sunken in it.
Spikelets subtended or surrounded by 1 to many bristles or spines (sterile branchlets), these distinct or more or less connate at base, forming a false involucre.
Bristles persistent; spikelets deciduous---44. Chaetochloa.
Bristles falling with the spikelets at maturity.
Bristles not united at base, usually slender, often plumose.
45. Pennisetum.
Bristles more or less united at the base, forming a bur---46. Cenchrus.
Spikelets not subtended or surrounded by bristles.
Spikelets awned, in 1-sided simple or somewhat compound racemes (pointed only in *Echinochloa colonum*).
Blades lanceolate, broad and thin; longest awn on the first glume.
42. Oplismenus.
Blades long and narrow; longest awn on the sterile lemma.
43. Echinochloa.
Spikelets awnless.
Spikelets in open panicles.
Spikelets globose, oblique on the pedicels. Culms usually woody.
37. Lasiacis.
Spikelets not globose and obliquely set on the pedicels.
Spikelets with 2 perfect florets---41. Isachne.
Spikelets with 1 perfect floret.
Fertile lemma with wings or broad scars at base.
36. Ichnanthus.
Fertile lemma not winged nor broadly scarred at base.
First glume wanting. Spikelets silky-hairy.
26. Leptocoryphium.
First glume present.
Fruit indurate, its margin inrolled; first glume usually shorter than the spikelet---35. Panicum.
Fruit cartilaginous, the margin not inrolled; first glume as long as the spikelet---40. Homolepis.
Spikelets in spikelike panicles or in 1-sided racemes, the racemes digitate or racemose.
Rachilla joint and adnate first glume forming a swollen ringlike callus at the base of the spikelet---32. Eriochloa.
Rachilla joint not forming a ringlike callus.
Inflorescence a long narrow panicle, spikelike or with numerous appressed racemes of pointed spikelets.
Second glume inflated-saccate; blades linear---38. Sacciolepis.
Second glume not saccate; blades cordate at base.
39. Hymenachne.
Inflorescence not long and narrow. (Racemes distant and appressed in *Panicum geminatum*.)

Fruit cartilaginous, not rigid, the margins of the lemma flat, not inrolled. Inflorescence of digitate or flabellately panicled, slender racemes.

Spikelets conspicuously long-silky_____27. **Valota.**

Spikelets glabrous or with short pubescence_28. **Syntherisma.**

Fruit indurate, rigid (subindurate in some species of *Paspalum*).

Spikelets solitary, subsessile, placed with the back of the fruit turned away from the rachis.

First glume wanting_____33. **Axonopus.**

First glume as long as the spikelet.

Racemes single, dense_____30. **Echinolaena.**

Racemes several, loose_____31. **Pseudechinolaena.**

Spikelets in 2's or 3's or solitary, placed with the back of the fruit turned toward the rachis.

First glume wanting (rarely present in a part of the spikelets, commonly present in *P. decumbens*); spikelets plano-convex, in dense 1-sided spikelike racemes.

34. Paspalum.

First glume present; spikelets biconvex_____35. **Panicum.**

10. ANDROPOGONEAE.

Spikelets all perfect.

Inflorescence of 2 to several racemes_____59. **Ischaemum.**

Inflorescence a densely-flowered hairy panicle _____49. **Imperata.**

Spikelets not all perfect, the sessile usually perfect, the pedicellate usually staminate or rudimentary (pistillate in *Eriochrysis*).

Pedicels thickened, appressed to the thickened rachis joint (at least parallel to it) or adnate to it; spikelets awnless, appressed to the joint.

Racemes subcylindric; rachis joints and pedicels glabrous, much thicker at the summit, the spikelets sunken in the hollow below; sterile spikelet rudimentary_____58. **Manisuris.**

Racemes flat; rachis joints and pedicels woolly, not much thicker at the summit; sterile spikelet staminate or neuter_____57. **Elyonurus.**

Pedicels not thickened (if slightly so the spikelets awned), neither appressed nor adnate to the rachis joint, this usually slender; spikelets usually awned.

Fertile spikelet with a hairy-pointed callus, formed of the attached supporting rachis joint or pedicel. Awns strong.

Primary spikelet subsessile, sterile, persistent on the continuous axis after the fall of the fertile pedicellate spikelet, the pedicel forming the callus_____56. **Trachypogon.**

Primary spikelet sessile, fertile; pedicellate spikelet sterile; lower few to several pairs of spikelets all staminate or neuter.

55. Heteropogon.

Fertile spikelet without a callus, the rachis disarticulating immediately below the spikelet.

Inflorescence a dense golden-brown silky panicle; spikelets awnless, the pedicellate one pistillate_____54. **Eriochrysis.**

Inflorescence not a dense golden-brown silky panicle; pedicellate spikelet staminate or rudimentary.

Spikelets in reduced racemes of 1 to 5 (rarely 7) joints, these peduncled in open panicles. Awns, if present, commonly deciduous.

53. Holcus.

Spikelets in evident racemes of several to many joints.
Inflorescence an elongate panicle of whorled long-peduncled slender glabrous racemes; spikelets muricate, awnless--52. **Anatherum.**
Inflorescence not a panicle of long-peduncled racemes; spikelets not muricate. Racemes often conspicuously woolly.
Racemes 2, forking from the summit of the slender peduncle, a staminate awnless spikelet borne in the fork.
51. **Cymbopogon.**
Racemes 1 to many, not forking with a spikelet borne in the fork.
50. **Andropogon.**

11. TRIPSACEAE.

Pistillate spikelets sunken in recesses in the thickened joints of the rachis.
Inflorescence of solitary or digitate spikes----------60. **Tripsacum.**
Pistillate spikelets inclosed in a bony bead-like involucre----------61. **Coix.**

1. ARUNDINARIA Michx.

Spikelets few to many-flowered; stamens 3.

1. **Arundinaria deflexa** N. E. Brown, Trans. Linn. Soc. II. Bot. 6[1]: 75. 1901.

Blades ovate-lanceolate, deflexed, 10 to 15 cm. long, 2 to 2.5 cm. wide, the summit of the sheath long-fimbriate.

McConnell & Quelch 678, summit of Mt. Roraima, the type collection and the only one known.

2. CHUSQUEA Kunth.

Spikelets small, with 1 perfect floret and 2 empty lemmas below it; stamens 3; blades disarticulating from the persistent sheaths.

1. **Chusquea linearis** N. E. Brown, Trans. Linn. Soc. II. Bot. 6[1]: 76. 1901.

A climbing bamboo with short leafy branches in clusters on the main stem, the blades 10 to 15 mm. long and 2 to 3 mm. wide; inflorescence narrow, few-flowered, terminating the short branches.

McConnell & Quelch 677, summit of Mt. Roraima, the type collection and the only one known.

3. GUADUA Kunth.

Spikelets several-flowered, subterete, elongate; stamens 6; palea winged. Our species spiny.

Blades less than 2 cm. wide----------1. **G. angustifolia.**
Blades more than 2 cm. wide----------2. **G. glomerata.**

1. **Guadua angustifolia** Kunth, Syn. Pl. Aequin. 1: 253. 1822.

Bambusa guadua Humb. & Bonpl. Pl. Aequin. 168. *pl. 20.* 1808.

Nastus guadua Spreng. Syst. Veg. 2: 113. 1825.

A tall bamboo, as much as 10 meters tall and 15 cm. in diameter; blades about 15 cm. long and 12 to 18 mm. wide; spikelets often curved, at maturity 3.5 to nearly 7 cm. long.

RANGE: Colombia to Peru and Guiana. Originally described from Colombia.

SPECIMENS FROM BRITISH GUIANA: Demerara River, *Jenman* 605. Aruka River, *Jenman* 7274. Without locality, *Jenman* 6249, 6370.

2. **Guadua glomerata** Munro, Trans. Linn. Soc. 26: 79. 1868.

A climbing or clambering bamboo; blades 10 to 15 cm. long, 2 to 3 cm. wide; spikelets few in a cluster at the ends of the foliage branchlets, as much as 6 cm. long, the lower deflexed, stouter than those of *G. angustifolia.*

RANGE: River banks, Guiana to Brazil. Originally described from the Río Negro.

SPECIMENS FROM BRITISH GUIANA: Rockstone, climbing high, wet forest, *Hitchcock* 17331. Bartica, *Jenman* 2445. Essequibo and Demerara rivers, *Jenman* 6352.

Bambos vulgaris Schrad., the common bamboo, is frequently cultivated and may be spontaneous.

4. ERAGROSTIS Host.

Spikelets few to many-flowered, compressed; glumes and lemmas keeled, the lemmas 3-nerved; rachilla often continuous, the paleas usually persistent after the fall of the fruit. Our species are all annuals.

Palea ciliate on the keels, the cilia usually as long as the width of the lemmas.
Spikelets about 2 mm. long, pediceled; panicle open_____1. **E. amabilis.**
Spikelets usually 3 to 4 mm. long, sometimes many-flowered, mostly subsessile; panicle close and spikelike, usually interrupted____2. **E. ciliaris.**
Palea not long-ciliate on the keels.
Spikelets nearly sessile, linear, many-flowered, the pedicels villous.
3. E. maypurensis.
Spikelets pediceled, the pedicels glabrous or scabrous only, as long as the spikelets or longer.
Spikelets linear, many-flowered, on stiff straight spreading pedicels.
4. E. guianensis.
Spikelets mostly less than 8-flowered, ovate or ovate-oblong.
Spikelets 2 mm. wide, mostly 6 to 8-flowered_____5. **E. tephrosanthos.**
Spikelets 1.5 mm. wide, mostly 3 to 5-flowered_____6. **E. pilosa.**

1. **Eragrostis amabilis** (L.) Wight & Arn.; Hook. & Arn. Bot. Beechey Voy. 251. 1841.

Poa amabilis L. Sp. Pl. 68. 1753.

Poa plumosa Retz. Obs. Bot. **4**: 20. 1786.

Eragrostis plumosa Link, Hort. Berol. 1: 193. 1827.

A low tufted branching annual, with slender ascending or spreading culms, linear blades, and handsome oblong panicles, the spikelets mostly borne along the lower side of the ascending branches.

RANGE: Open ground and waste places, warmer regions of both hemispheres. A native of the Old World. Originally described from India.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Promenade Gardens, a weed in flower beds, *Hitchcock* 16580. Rockstone, *Gleason* 698.

2. **Eragrostis ciliaris** (L.) Link, Hort. Berol. 1: 192. 1827.

Poa ciliaris L. Syst. Nat. ed. 10. **2**: 875. 1759.

Plants spreading at base, the slender culms erect, mostly 10 to 30 cm. tall, with dense spikelike panicles, interrupted at base.

RANGE: Open ground and waste places, warmer regions of both hemispheres. Apparently introduced in America; originally described from Jamaica. Common in the West Indies but rare in British Guiana.

SPECIMENS FROM BRITISH GUIANA: Litchfield, along railway track, *Hitchcock* 16826. Tumatumari, open sandy-clay loam along road, *Hitchcock* 17333. Also Meyer, a fragment from a specimen in the Trinius Herbarium labeled "Fl. Esseq."

3. **Eragrostis maypurensis** (H. B. K.) Steud. Syn. Pl. Glum. 1:276. 1854.

Poa maypurensis H. B. K. Nov. Gen. & Sp. 1:161. 1816.
Poa vahlii Roem. & Schult. Syst. Veg. 2:563. 1817.
Eragrostis vahlii Nees, Agrost. Bras. 499. 1829.
Eragrostis amoena Presl, Rel. Haenk. 1:275. 1830.
Eragrostis panamensis Presl, Rel. Haenk. 1:277. 1830.
Megastachya amoena Fourn. Mex. Pl. 2:118. 1886.
Megastachya panamensis Fourn. Mex. Pl. 2:118. 1886.

Culms erect from a spreading base, 10 to 30 cm. tall, the narrow blades mostly near the base; panicles brownish or yellowish, narrow, the short branches somewhat distant, stiffly ascending, spikelet-bearing from the base; spikelets linear, as much as 15 mm. long.

RANGE: Open ground, especially in sandy soil, western Mexico to Brazil. Originally described from Venezuela.

SPECIMENS FROM BRITISH GUIANA: Tumatumari, open ground, sandy clay loam, along road, *Hitchcock* 17334; *Gleason* 39. Orealla, Courantyne River, *Jenman* 274*.[8] Inturibisci Lake, *Jenman* 2248. Kwaimatta, *Jenman* 6196, 6774*. Without locality, *Schomburgk* 1004.

4. **Eragrostis guianensis** Hitchc., sp. nov. Fig. 78.

Plants annual; culms cespitose, slender and wiry, about 20 cm. tall; sheaths glabrous or sparsely papillose-pilose, pilose at the throat; blades short and narrow, involute, filiform, 1 to 3 cm. long, sometimes sparsely pilose; panicle open, about 10 cm. long, the axis smooth, the capillary branches stiffly ascending-spreading, single, rather distant, naked in the axils, smooth or the ultimate pedicels scaberulous, the spikelets mostly borne on the secondary branches, each main branch bearing 1 to 4 spikelets, the shorter pedicels being about 5 mm. long; spikelets linear, mostly 1.5 to 2 cm. long, scarcely 2 mm. wide; yellowish or brownish, as many as 50-flowered; glumes acute, narrow, 1-nerved, a little unequal, the first 1 mm. long, smooth on the keel; lemmas closely imbricate, ovate-lanceolate, about 1.5 mm. long, obtusish, strongly 3-nerved, smooth; palea persistent, minutely scaberulous or ciliolate on the keels.

Type in the U. S. National Herbarium, no. 1,039,337, collected at Kwaimatta, Rupununi River, southern British Guiana, October, 1888, by G. S. Jenman (no. 5970).

The only other specimens seen is from Mt. Roraima (*Loyed* 13*).

5. **Eragrostis tephrosanthos** Schult. Mant. 2: 316. 1824.

Eragrostis delicatula Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 2[1]: 73. 1836.

A delicate spreading grass, the culms 10 to 20 cm. long, with oblong or ovoid panicles; spikelets mostly 3 to 5 mm. long, green or olive.

RANGE: Open ground, fields, and waste places, West Indies to Brazil. Originally described from Martinique.

SPECIMENS FROM BRITISH GUIANA: Georgetown, along walks in the Promenade Gardens, *Hitchcock* 16599. Morawhanna, a weed in the grounds of Commissioner King, *Hitchcock* 17471. Lamaha, *Jenman* 3885. Coast lands, *Jenman* 4375, 5999.

6. **Eragrostis pilosa** (L.) Beauv. Ess. Agrost. 162. 1812.

Poa pilosa L. Sp. Pl. 68. 1753.

Similar in habit to the preceding, the panicle more delicate, the spikelets narrower.

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[8] The numbers marked with an asterisk are in the Jenman Herbarium at Georgetown but are not in the U. S. National Herbarium.

FIG. 78.—*Eragrostis guianensis.* From the type specimen.

RANGE: Open ground and waste places in warm and temperate regions of both hemispheres. Originally described from Italy. Common in the West Indies but rare in British Guiana.

SPECIMEN FROM BRITISH GUIANA: Bartica, a weed around the house at Agatasch Estate, *Hitchcock* 17188.

5. ORTHOCLADA Beauv.

Spikelets articulate below the glumes, 1-flowered with a prolongation of the rachilla or 2-flowered, the florets distant; glumes and lemmas acuminate.

1. **Orthoclada laxa** (L. Rich.) Beauv.; Nees, Agrost. Bras. 522. 1829.

Aira laxa L. Rich. Act. Soc. Hist. Paris 1: 106. 1792.

Panicum rariflorum Lam. Encycl. 4: 746. 1798.

Orthoclada rariflora Beauv. Ess. Agrost. 70. *pl. 14. f. 9.* 1812.

A stoloniferous perennial; flowering culms ascending, leafy, simple, commonly 0.5 to 1 meter long; blades slender-petioled, lanceolate, mostly 12 to 15 cm. long, about 2.5 cm. wide; panicle large, as broad as long, the long, slender, naked branches and capillary branchlets at first erect, finally stiffly divergent, bearing 1 to few spikelets at the extremities.

RANGE: Rich woods, southern Mexico to Brazil. Originally described from Cayenne.

SPECIMENS FROM BRITISH GUIANA: Akyma, floor of forest, *Hitchcock* 17451. Issorora, forest, *Hitchcock*, 17555. Orealla, Courantyne River, *Jenman* 258*. Upper Demerara River, *Jenman* 4092*. Lama, *Jenman* 5979. Berbice, *Jenman* 6814. Barima River, *Jenman* 7075*. Pomeroon River, *Bartlett* in 1904, *Stockdale* in 1909.

6. ARUNDO L.

Spikelets perfect, 2 to several-flowered; glumes about equaling the spikelet; lemmas bidentate, cuspidate between the teeth and with long, silky hairs on the back; rachilla naked.

1. **Arundo donax** L. Sp. Pl. 81. 1753. GIANT REED.

Tall reeds with strong, sparingly branching culms, elongate, scabrous-margined flat blades and densely flowered, slightly drooping panicles, 30 to 60 cm. long, the spikelets about 1 cm. long.

RANGE: River banks and moist ground, warmer parts of the Old World. Cultivated in the American tropics and established in many places.

SPECIMEN FROM BRITISH GUIANA: Litchfield, moist ground, *Hitchcock* 16827.

7. GYNERIUM Humb. & Bonpl.

Plants dioecious; spikelets 2-flowered; pistillate spikelets with long-attenuate second glumes much exceeding the small attenuate long-silky lemmas; staminate spikelets with shorter glumes and glabrous lemmas.

1. **Gynerium sagittatum** (Aubl.) Beauv. Ess. Agrost. 138. *pl. 24. f. 6.* 1812. UVA GRASS.

Saccharum sagittatum Aubl. Pl. Guian. 1: 50. 1775.

Gynerium saccharoides Humb. & Bonpl. Pl. Aequin. 2: 105. *pl. 115.* 1809.

Arundo saccharoides Poir. in Lam. Encycl. Suppl. 4: 703. 1816.

Stout reeds often 10 meters tall, with culms clothed below with old sheaths, the blades having fallen, sharply serrulate blades, commonly 2 meters long and 4 to 6 cm. wide (forming a great fan-shaped summit to the sterile culms), and pale, plumy, densely flowered panicles 1 meter or more long, the main axis erect, the branches drooping.

RANGE: River banks and moist ground, forming dense colonies, West Indies and southern Mexico to Brazil. Originally described from French Guiana.

SPECIMENS FROM BRITISH GUIANA: Parika, low ground near sea; plants as much as 8 meters tall, *Hitchcock* 16759. Morawhanna, swamp back of mangroves, *Hitchcok* 17518. Upper Demerara River, *Jenman* 4030. Demerara River, *Jenman* 4397*.

Beauvois's figure cited above (*pl. 24. f. 6*) is referred to in the description of plates as *Gynerium procerum*.

8. CORTADERIA Stapf.

Plants dioecious, the staminate and pistillate panicles alike in appearance; spikelets loosely 3 to 7-flowered, the glumes equal, exceeded by the delicate awn tips of the lemmas. Leaves narrow, mostly in a basal cluster.

1. **Cortaderia roraimensis** (N. E. Brown) Pilger, Notizbl. Bot. Gart. Berlin 6: 112. 1914.

Arundo roraimensis N. E. Brown, Trans. Linn. Soc. II. Bot. 6^1: 74. 1901.

Plant as much as 1 meter tall, the lower blades as much as 50 cm. long, the upper short and narrow; panicle 10 to 15 cm. long, about 5 cm. wide; spikelets 15 to 18 mm. long; glumes 7 to 9 mm. long; lemmas 6 mm. long with an awn about 8 mm. long, the hairs about 4 mm. long; palea 5 mm. long, oblong-linear, bifid at apex.

This species is known only from the type collection, *McConnell & Quelch* 673, summit of Mt. Roraima. It resembles *Cortaderia nitida* (H. B. K.) Pilger (*Arundo nitida* H. B. K.), from which it differs in having unisexual spikelets and shorter and fewer hairs on the lemma and rachilla joints.

9. TRIODIA R. Br.

Spikelets several-flowered; lemmas broad, rounded on the back, 2-lobed at apex, 3-nerved, the nerves pubescent below, produced as teeth at the summit.

1. **Triodia flaccida** (Doell) Hitchc.

Uralepis flaccida Doell in Mart. Fl. Bras. 2^3: 95. 1878.

Culms slender, as much as 1 meter tall; panicle open; spikelets 3 to 5-flowered, reddish; lemma mucronate between two short rounded lobes.

RANGE: Western Brazil and Guiana. Originally described from Brazil.

SPECIMEN FROM BRITISH GUIANA: Rupununi Savanna, *Melville*.

10. PARIANA Aubl.[a]

Spikelets in opposite clusters of 3 at each joint of a readily disarticulating rachis forming a spike, the center flower of the cluster pistillate, the other 2 staminate; stamens numerous.

The relationships of this genus are doubtful. Following Hackel, it is tentatively placed here as a representative of the Hordeae.

Sheaths long-fimbriate at the summit ..... 1. **P. radiciflora.**
Sheaths naked, or nearly so, at the summit ..... 2. **P. zingiberina.**

1. **Pariana radiciflora** Sagot; Doell in Mart. Fl. Bras. 2^2: 336. 1877.

Plants 30 to 50 cm. tall, the inflorescence on distinct shoots; sterile shoots leafy, the sheaths roughish toward the summit, the blades broad and flat, short-petioled, smooth, 10 to 15 cm. long 4 to 5 cm. wide, acuminate; fertile shoot with somewhat inflated sheaths, the blade reduced to a point or wanting; spike 5 to 7 cm. long, erect, awnless.

RANGE: Rich forests, Guiana to Brazil.

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[a] See page 513.

SPECIMENS FROM BRITISH GUIANA: Kartabo, near cassava patch in edge of clearing, *Hitchcock* 17211. Rockstone, *Bartlett* 8573*. Essequibo River, *Jenman* 1311*. Mazaruni River, *Jenman* 5798*.

2. Pariana zingiberina Doell in Mart. Fl. Bras. 2^2: 337. 1877.

Differs from the preceding chiefly in the absence of the fimbriae at the summit of the sheaths. The blades are narrower, up to 3.5 cm. in our specimen.

RANGE: Rich forest, Guiana to Brazil.

SPECIMEN FROM BRITISH GUIANA: Bartica, *Jenman* 6026. Rockstone, *Gleason* 860.

11. LEPTOCHLOA Beauv.

Spikelets few to many-flowered, short-pedicellate, appressed, loosely imbricate along a narrow rachis, forming slender racemes, these numerous in an elongate panicle; glumes and lemmas keeled, the lemmas 3-nerved.

Plants annual.

Sheaths papillose-hispid ..... 1. L. filiformis.

Sheaths minutely scabrous but not hispid ..... 2. L. scabra.

Plants perennial.

Sheaths and blades glabrous, usually somewhat glaucous; florets awnless or the awn shorter than the body of the lemma ..... 3. L. virgata.

Sheaths sparsely papillose-hispid; awns, or some of them, about as long as their lemmas ..... 4. L. domingensis

1. Leptochloa filiformis (Lam.) Beauv. Ess. Agrost. 71, 166. 1812.

Festuca filiformis Lam. Tabl. Encycl. 1: 191. 1791.

Eleusine mucronata Michx. Fl. Bor. Amer. 1: 65. 1803.

Eleusine filiformis Pers. Syn. Pl. 1 : 87. 1805.

Leptostachys filiformis Meyer, Prim. Fl. Esseq. 74. 1818.

Leptochloa mucronata Kunth, Rév. Gram. 1: 91. 1829.

Culms ascending or erect, geniculate below, branching at the base, commonly 40 to 70 cm. tall (dwarf specimens 10 to 20 cm. tall); blades thin, flat; racemes very slender, spreading.

RANGE: Fields and open ground, southern United States to Argentina. Originally described from tropical America.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Promenade Gardens, a weed in flower beds, *Hitchcock* 16579. Coast lands, *Jenman* 6035, 6037.

2. Leptochloa scabra Nees, Agrost. Bras. 435. 1829.

Resembling the preceding, but commonly taller and more robust, the inflorescence narrower, the spikes less slender, ascending, flexuous, the spikelets larger.

RANGE: Ditches and wet places, West Indies to Brazil, whence originally described.

SPECIMENS FROM BRITISH GUIANA: Georgetown, near Peters Hall, a weed along canal, *Hitchcock* 16686. New Amsterdam, along ditch, *Hitchcock* 16832. Morawhanna, a weed in the grounds of Commissioner King, *Hitchcock* 17479. Lamaha, *Jenman* 3730. Coast regions, *Jenman* 2163*, 4441.

3. Leptochloa virgata (L.) Beauv. Ess. Agrost. 71, 161, 166. *pl. 15. f. 1.* 1812.

Cynosurus virgatus L. Syst. Nat. ed. 10. 2 : 876. 1759.

Leptostachys virgata Meyer, Prim. Fl. Esseq. 74. 1818.

Leptochloa perennis Hack. Inf. Est. Centr. Agron. Cuba 1: 411. 1906.

Culms in small tufts, tall, slender, strong and wiry, sparingly branching; blades flat; racemes commonly about 10 cm. long, lax, ascending, aggregate toward the summit of the culm.

RANGE: Open ground and brush land, Mexico and the West Indies to Brazil. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Peters Hall, low ground in field back of the sea, *Hitchcock* 16667. Issorora, wet field, *Hitchcock* 17583. Coast Region, *Jenman* 4371*, 4429*, 6261. Lamaha Dam, *Jenman* 6016.

4. **Leptochloa domingensis** (Jacq.) Trin. Fund. Agrost. 133. 1820.

Cynosurus domingensis Jacq. Misc. Austr. 2: 363. 1781.

Leptostachys domingensis Meyer, Prim. Fl. Esseq. 74. 1818.

Leptochloa virgata gracilis Nees; Griseb. Fl. Brit. W. Ind. 538. 1864.

Leptochloa virgata domingensis Link; Griseb. Fl. Brit. W. Ind. 538. 1864.

Resembling the preceding, but the panicles more elongate and the racemes more numerous.

RANGE: Open ground, Mexico and the West Indies to Brazil and Peru. Original locality not given, presumably Santo Domingo.

SPECIMENS FROM BRITISH GUIANA: Kwaimatta, *Jenman* 5965, 6204.

12. ELEUSINE Gaertn.

Spikelets several to many-flowered, densely imbricate in thick spikes, these subdigitate; glumes and lemmas with thickened 5-nerved keels, acute; caryopsis with a thin pericarp, the seed marked with fine transverse lines.

1. **Eleusine indica** (L.) Gaertn. Fruct. & Sem. 1: 8. 1788. GOOSE GRASS.

Cynosurus indicus L. Sp. Pl. 72. 1753.

A weedy annual with spreading or ascending flattened, branching culms, thin flat linear blades, and 2 to several spikes (sometimes 1 spike 1 to 3 cm. below) 5 to 10 cm. long.

RANGE: Open ground and waste places. A common weed of warm and warm-temperate regions. Introduced in America; originally described from India.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Promenade Gardens, a weed in flower beds, *Hitchcock* 16577. Penal Settlement, a weed around Colony House, *Hitchcock* 17068. Demerara River, *Jenman* 4370. Coast region, *Jenman* 4379, 4501. Bartica, *Jenman* 6011. Rupununi Savanna, *Melville**.

13. DACTYLOCTENIUM Willd.

Spikelets as in Eleusine, but the glumes and lemmas mucronate or awn-tipped; apex of the rachis extending as a point beyond the spikelets.

1. **Dactyloctenium aegyptium** (L.) Richt. Pl. Eur. 1: 68. 1890.

Cynosurus aegyptius L. Sp. Pl. 72. 1753.

Dactyloctenium aegyptiacum Willd. Enum. Pl. 1029. 1809.

A weedy, stoloniferous, more or less pilose annual, often forming dense mats, the flat culms 10 to 50 cm. long, the blades flat, usually short, the spikes 2 to 4, short, thick, radiate at the apex of the culm.

RANGE: Open ground and waste places. A common weed in warm countries. Introduced in America; originally described from "Africa, Asia, America."

SPECIMENS FROM BRITISH GUIANA: Georgetown, grassland in park back of sea wall, *Hitchcock* 17660. Coast region, *Jenman* 4439, 4521. Georgetown, behind sea wall, *Jenman* 6345.

14. CAPRIOLA Adans.

(*Cynodon* L. Rich.)

Spikelets 1-flowered, with a prolongation of the rachilla, imbricate in slender digitate spikes; glumes unequal, narrow, acute; lemma broad, boat-shaped, inclosing a palea of equal length.

1. **Capriola dactylon** (L.) Kuntze, Rev. Gen. Pl. 2 : 764. 1891. BERMUDA GRASS.
Panicum dactylon L. Sp. Pl. 58. 1753.
Cynodon dactylon Pers. Syn. Pl. 1: 85. 1805.

A low, extensively creeping perennial with compressed wiry culms, narrow, usually short blades, and 3 to 5 slender arcuate-spreading spikes 3 to 7 cm. long.

RANGE: Common in open, rather dry ground in the warmer parts of both hemispheres; apparently introduced in America. Originally described from southern Europe. In British Guiana and the British West Indies this is usually called Bahama grass.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, grassland, *Hitchcock* 16722. Demerara River, *Jenman* 4194. Coast lands, *Jenman* 6013. Georgetown, sea wall, *Jenman* 6346. Without locality, *Jenman* 4394.

15. SPARTINA Schreb.

Spikelets 1-flowered, sessile, flattened laterally, densely pectinate in thick, racemosely arranged spikes; glumes unequal, acuminate; lemma and palea obtuse, subequal.

1. **Spartina brasiliensis** Raddi, Agros. Bras. 21. 1823.

Culms erect from extensively creeping rootstocks, mostly a meter or less in height; spikes appressed or suberect, the inflorescence 15 to 20 cm. long, the rachis of the spikes extended as a flexuous bristle.

RANGE: Tidal flats, Guiana to Brazil. Originally described from Rio de Janeiro.

SPECIMENS FROM BRITISH GUIANA: Vreed-en-Hoop, in mud on tidal flat, *Hitchcock* 16721. Plantation Leonora, "Rice Grass," *Bartlett* in 1907. Vryheids Lust, *Bartlett*. Demerara River, estuary, *Jenman* 4393, 5986.

16. GYMNOPOGON Beauv.

Spikelets with 1 perfect floret and 2 or 3 sterile florets, mostly reduced to single awns, above it; glumes equaling or exceeding the florets; fertile lemma narrow, long-awned; spikelets distant or approximate, appressed along a slender axis.

1. **Gymnopogon foliosus** (Willd.) Nees, Agrost. Bras. 426. 1829.
Chloris foliosa Willd. Sp. Pl. 4: 924. 1806.

A tufted annual, the wiry branching, short-jointed culms ascending (sometimes decumbent at base), 15 to 50 cm. tall, with numerous short, squarrose blades and a subdigitate inflorescence of few to several ascending, delicately awned spikes.

RANGE: White sand barrens or scrubs, West Indies to Brazil. Originally described from St. Thomas.

SPECIMENS FROM BRITISH GUIANA: Wismar, sandy ridge in pure sand, *Hitchcock* 17273. Ituribisci Lake, *Jenman* 2246. Demerara River, *Jenman* 4588. Kwaimatta Savanna, *Jenman* 5993. Rockstone, *Gleason* 531.

17. CHLORIS Swartz.

Spikelets with 1 perfect floret, sessile along a slender rachis forming unilateral spikes, these digitate; glumes unequal; lemma awned or mucronate; rachilla prolonged behind the palea and bearing 1 to few rudimentary awned sterile lemmas.

Plants annual; sterile floret narrow, the apex acute or subacute.
1. C. radiata.
Plants perennial; sterile floret broad, truncate, broadest at the summit.
2. C. polydactyla.

1. Chloris radiata (L.) Swartz, Prodr. Veg. Ind. Occ. 26. 1788.

Agrostis radiata L. Syst. Nat. ed. 10. 2: 873. 1759.

A weedy branching decumbent-ascending annual, the sheaths broad, compressed, the blades thin, flat, or folded, scaberulous or sparsely pilose, the slender spikes somewhat flexuous.

RANGE: Ditches and waste places, southern Mexico and the West Indies to northern South America. Originally described from Jamaica.

SPECIMEN FROM BRITISH GUIANA: New Amsterdam, waste places along road, *Hitchcock* 16833.

2. Chloris polydactyla (L.) Swartz, Prodr. Veg. Ind. Occ. 26. 1788.

Andropogon polydactylon L. Sp. Pl. ed. 2. 1483. 1763.

Culms rather stout, commonly more than 1 meter tall; blades about 1 cm. wide; spikes 5 to 10, pale, usually 8 to 10 cm. long, strongly flexuous.

RANGE: Savannas and grassy slopes, Florida and the West Indies to Brazil. Originally described from Jamaica.

SPECIMEN FROM BRITISH GUIANA: Kwaimatta, *Jenman* in 1894.

18. BOUTELOUA Lag.

Spikelets with 1 perfect floret, and 1 or 2 rudimentary florets above it, in short spikes, these racemose on the main axis; glumes unequal; fertile lemma rather broad, usually 3 to 5-toothed, commonly mucronate or awned; sterile lemmas usually with 3 awns.

1. Bouteloua americana (L.) Scribn. Proc. Acad. Phila. 1891: 306. 1891.

Aristida americana L. Syst. Nat. ed. 10. 2: 879. 1759.

Bouteloua litigiosa Lag. Gen. & Sp. Nov. 5. 1816.

Bouteloua elatior Griseb. Fl. Brit. W. Ind. 537. 1864.

A tufted perennial, the freely branching flattened wiry culms often 60 or 70 cm. long (sometimes longer), decumbent with ascending ends, the narrow blades mostly involute-pointed, the few to several slender, loosely flowered spikes divergent, rather distant.

RANGE: Open ground, West Indies to Panama and Venezuela. Originally described from Jamaica. Apparently introduced in British Guiana.

SPECIMEN FROM BRITISH GUIANA: Georgetown, park back of sea wall, grassland among Bermuda grass, *Hitchcock* 16835.

19. SPOROBOLUS R. Br.

Spikelets in spikelike or open panicles, awnless; one or usually both glumes shorter than the floret; palea readily splitting; pericarp of the caryopsis loose, the seed readily falling therefrom.

Plants producing numerous creeping rhizomes——1. S. virginicus.
Plants cespitose, without creeping rhizomes.
Blades flat, pilose and ciliate——2. S. ciliatus.
Blades folded or involute, slender.
Lower sheaths woolly-villous; second glume nearly as long as the spikelet.
3. S. aeneus.
Lower sheaths not woolly; both glumes much shorter than the spikelet.
4. S. indicus.

1. Sporobolus virginicus (L.) Kunth, Rév. Gram. 1: 67. 1829.

Agrostis virginica L. Sp. Pl. 63. 1753.

Culms 15 to 40 cm. tall, erect from extensively creeping, hard, scaly rhizomes, the numerous leaves conspicuously distichous, the sheaths overlapping, the blades firm, involute-pointed; panicles spikelike, commonly not over 5 cm. long.

Extensive colonies of sterile plants often found along sandy beaches.

RANGE: Saline soil along the coast, Virginia to Brazil. Originally described from Virginia.

SPECIMENS FROM BRITISH GUIANA: New Amsterdam, brackish meadow, *Hitchcock* 16831. Georgetown, along road by sea wall, *Hitchcock* 16834. Demerara, near the seashore, *Jenman* 4524, 5992, 6043*, 6416*.

2. Sporobolus ciliatus Presl, Rel. Haenk. 1: 242. 1830.

Culms 10 to 30 cm. tall, the leaves mostly toward the base; blades rather stiff, mostly 5 to 10 cm. long, as much as 5 mm. wide; panicle spikelike, somewhat interrupted.

RANGE: Open ground, Mexico to Brazil. Originally described from Panama.

SPECIMENS FROM BRITISH GUIANA: Horeabea Savanna, *Jenman* 3748. Demerara River, *Jenman* 4506.

3. Sporobolus aeneus (Trin.) Kunth. Rév. Gram. 1: Suppl. xvii. 1830.

Vilfa aenea Trin. Gram. Icon. 1: *pl. 23.* 1826.

Sporobolus cubensis Hitchc. Contr. U. S. Nat. Herb. 12: 237. 1909.

Plants in dense bunches with numerous innovations; culms 30 to 60 cm. tall, the basal sheaths (especially of the innovations) woolly or villous; blades long and narrow, firm, folded; panicle narrow but open, the branches ascending, more or less whorled; spikelets 3 mm. long, the first glume about half as long.

RANGE: Sandy barrens, Cuba to Brazil, whence originally described.

SPECIMENS FROM BRITISH GUIANA: Wiruni-Ituni Savanna, County Berbice (Cattle-trail Survey), *Abraham* 8. Orealla, Courantyne River, *Jenman* 47.

4. Sporobolus indicus (L.) R. Br. Prodr. Fl. Nov. Holl. 1: 170. 1810.

Agrostis indica L. Sp. Pl. 63. 1753.

Sporobolus jacquemontii Kunth, Rév. Gram. 2: 427. *pl. 127.* 1831.

Culms erect, 0.6 to 1 meter tall, in large clumps with numerous leafy shoots at the base; panicle 15 to 30 cm. long, the slender branches ascending, the short-pediceled spikelets mostly borne along the lower side.

RANGE: Common in grassland, West Indies and Mexico to Brazil. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, grassland, *Hitchcock* 16581. Coast region, *Jenman* 2167*, 6010, 6033*. Lamaha, *Jenman* 3820*. Georgetown, Botanic Gardens, rice field, *Kartright* in 1912.

20. ARISTIDA L.

Spikelets in close or open panicles; glumes acuminate; lemma convolute, subindurate with a pointed callus and bearing from the apex a trifid awn.

1. Aristida capillacea Lam. Tabl. Encycl. 1: 156. 1791.

Aristida elegans Rudge, Pl. Guian. 22. *pl. 30.* 1805.

Plants annual, tufted; culms delicate, 10 to 20 cm. tall; panicles narrow but somewhat open; fruit (excluding awns) 3 mm. long, the awns equal, about 5 mm. long.

RANGE: Open ground, southern Mexico to Brazil. Originally described from tropical America.

SPECIMENS FROM BRITISH GUIANA: Savannas, *Jenman* 7280*. Mt. Roraima, *Loyed* 12*. Without locality, *Schomburgk* 799.

An immature unidentified species of *Aristida* was collected on the Canje River by Jenman (nos. 1899*, 1900*). The two specimens may belong to different species. They are both rather stout perennials, one with involute blades, the other with flat blades.

21. ORYZA L.

Spikelets perfect, paniculate, laterally compressed; glumes minute; lemma and palea subindurate, papillose-roughened, the lemma awned (the awn sometimes obsolete).

1. **Oryza sativa** L. Sp. Pl. 333. 1753. RICE.

The cultivated rice is occasionally spontaneous.

SPECIMENS FROM BRITISH GUIANA: Rupununi Savanna, *Melville*. Pomeroon River, *Stockdale* in 1909.

22. HOMALOCENCHRUS Mieg.

(*Leersia* Swartz.)

Spikelets awnless, the glumes wanting, otherwise as in *Oryza*, the plants and spikelets much smaller.

1. **Homalocenchrus hexandrus** (Swartz) Kuntze, Rev. Gen. Pl. 2: 777. 1891.

Leersia hexandra Swartz, Prodr. Veg. Ind. Occ. 21. 1788.

A scabrous aquatic perennial, the slender culms 30 to 50 cm., or sometimes more than 1 meter tall, erect from a creeping base, the flat blades mostly 15 to 20 cm. long and about 8 mm. wide, the many-flowered panicle pale or purplish.

Extensively creeping stolons with short blades are sometimes produced in land bordering ponds and ditches.

RANGE: Swamps and ditches, southern United States to Uruguay. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, in water or mud along canal, *Hitchcock* 16547. Lamaha Canal, *Bartlett* in 1907. Coast regions, *Jenman* 2203, 4433, 4516, 4543, 4544, 6018*. Lamaha Canal, *Jenman* 3685, 4557*. Horeabea, *Jenman* 4452.

23. LUZIOLA Gmel.

Pistillate and staminate spikelets in separate panicles; glumes wanting; caryopsis with a thick, hard pericarp.

1. **Luziola spruceana** Benth.; Doell in Mart. Fl. Bras. 2^2: 18. 1871.

Culms thick, soft and spongy, freely branching; sheaths broad, with long, erect auricles; staminate panicles terminal; pistillate panicles terminal and axillary, corymbose, the numerous branches reflexed at maturity.

RANGE: Ponds and lagoons, Cuba to Brazil, whence originally described.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, in water of canal, *Hitchcock* 16537. Coast regions, *Jenman* 1745, 4420, 4494. Demerara River, *Jenman* 4197*. Also *Meyer*, fragment from specimen in the Trinius Herbarium labeled "*Luziola peruviana* Pers. F. Esseq."

24. PHARUS L.

Spikelets in pairs, appressed along the slender, spreading, nearly simple panicle branches, one pistillate, subsessile, the other staminate, pedicellate, much smaller than the pistillate spikelet; fertile lemma subindurate, terete, clothed (at least toward the beaked apex) with thick uncinate hairs; blades with fine transverse veins between the longitudinal nerves, petioled (the petiole

with a single twist reversing the upper and under surfaces of the blade), the nerves running from midnerve to margin.

1. **Pharus latifolius** L. Syst. Nat. ed. 10. 2: 1269. 1759.

An erect glabrous perennial 50 to 75 cm. tall, with flat oblanceolate acuminate blades commonly 15 to 25 cm. long and 4 to 6 cm. wide, and large, open, fragile panicles, the few branches stiffly ascending or spreading, the appressed, oblong, brown spikelets 12 to 15 mm. long, the fruit pubescent at tip with hooked hairs; panicles readily breaking up, the pieces attaching themselves by the hooked hairs to passing objects.

RANGE: Rich woods, West Indies to Brazil. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Kartabo, rich forest along edge of clearing, *Hitchcock* 17205. Kwaimatta, *Jenman* 6045*.

25. ARUNDINELLA Raddi.

Spikelets short-pedicellate in large panicles; glumes acuminate, the tips widely spreading, the second longer than the first and the sterile lemma; fertile lemma minute, bearded on the callus, bearing a long, slender awn from the apex.

1. **Arundinella hispida** (Willd.) Kuntze, Rev. Gen. Pl. 2: 761. 1891.

Andropogon hispidus Humb. & Bonpl.; Willd. Sp. Pl. 4: 908. 1806.

Ischaemum hispidum H. B. K. Nov. Gen. & Sp. 1: 194. 1816; Kunth, Rév. Gram. *pl. 100.* 1830.

Arundinella brasiliensis Raddi, Agrost. Bras. 37. 1823.

A tall, reedlike perennial with hispid sheaths and blades and condensed panicles 5 to 15 cm. long, the numerous branches ascending, 4 to 6 cm. long; spikelets about 3 mm. long, the awn geniculate and twisted, exserted 1 to 2 mm. at one side.

RANGE: Savannas, Guiana to Brazil, whence originally described.

SPECIMEN FROM BRITISH GUIANA: Mt. Roraima, "our house," *Im Thurn* 254.

26. LEPTOCORYPHIUM Nees.

Spikelets in narrow panicles; first glume wanting; sterile lemma empty, this and the second glume hairy; fertile lemma and palea brown, with a white hyaline, somewhat lacerate or ciliate summit, open at maturity.

1. **Leptocoryphium lanatum** (H. B. K.) Nees, Agrost. Bras. 84. 1829.

Paspalum lanatum H. B. K. Nov. Gen. & Sp. 1: 94. *pl. 29.* 1816.

Anthaenantia lanata Benth. Journ. Linn. Soc. Bot. 19: 39. 1881.

A slender, erect, unbranched, tufted perennial up to 1 meter tall, with long, narrow, often involute blades and loose, many-flowered, oblong panicles with capillary branchlets and silky-pilose spikelets, the hairs at first appressed, at maturity spreading.

RANGE: Dry hills and savannas, West Indies and southern Mexico to Uruguay. Originally described from Mexico.

SPECIMEN FROM BRITISH GUIANA: Wiruni-Ituni Savannas, County Berbice (Cattle-trail Survey), *Abraham* 40.

27. VALOTA Adans.

Spikelets in pairs, short-pedicellate in 2 rows along one side of a narrow rachis, the slender racemes aggregate in a narrow or flabellate panicle; spikelets lanceolate, clothed with long, silky hairs; first glume minute; fruit acuminate, brown with broad white hyaline margins.

Panicle narrow, the branches erect or ascending; spikelets densely clothed with tawny or brown silky hairs much exceeding the spikelet__1. V. insularis.
Panicle open, the slender branches widely spreading; spikelets sparsely villous, the hairs shorter than the spikelets_____2. V. laxa.

1. Valota insularis (L.) Chase, Proc. Biol. Soc. Washington 19: 188. 1906.
Andropogon insularis L. Syst. Nat. ed. 10. 2: 1304. 1759.
Panicum lanatum Rottb. Act. Lit. Univ. Hafn. 1: 269. 1778.
Panicum leucophaeum H. B. K. Nov. Gen. & Sp. 1: 97. 1816.
Panicum insulare Meyer, Prim. Fl. Esseq. 60. 1818.
Trichachne insularis Nees, Agrost. Bras. 86. 1829.
Tricholaena insularis Griseb. Abh. Ges. Wiss. Göttingen 7: 265. 1857.

A rather coarse, tufted, weedy perennial, with sparsely hirsute sheaths, flat, usually scabrous blades, and silky panicles tawny at maturity.

RANGE: Open ground and waste places in the tropics and subtropics of America at low altitudes. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Mahaica, in field near coast, *Hitchcock* 16768. Rupununi Savanna, *Melville**. Also *Meyer*, a fragment from a specimen in the Trinius Herbarium labeled "Fl. Esseq."

2. Valota laxa (Reichenb.) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 292. 1917.
Reimaria laxa Reichenb.; Spreng. Tent. Suppl. Syst. Veg. 2. 1828.
Trichachne recalva Nees, Agrost. Bras. 88. 1829.

Culms 1 to 2 meters tall, decumbent at base; sheaths tuberculate-hispid; panicle large and open.

The stiff hairs of the sheaths break off in handling and penetrate the skin.

RANGE: Open moist ground, southern West Indies to Paraguay. Originally described from Surinam [Dutch Guiana].

SPECIMENS FROM BRITISH GUIANA: Parika, moist low ground among shrubs, *Hitchcock* 16757. Demerara River, *Jenman* 4185. Lamaha Canal, No. 1 Benab, *Jenman* 4561. Lamaha Dam, *Jenman* 6017*.

28. SYNTHERISMA Walt.

(*Digitaria* Hall.)

Spikelets in twos or threes, short-pedicellate in two rows along one side of a narrow rachis, the slender racemes digitate or subdigitate; spikelets lanceolate or elliptic; first glume minute or obsolete; fruit acute, the hyaline margins of the lemma narrow.

Rachis of racemes winged on the margins, the green wing on each side as wide as the whitish center.
Spikelets about 3 mm. long; sheaths pilose_____1. S. sanguinalis.
Spikelets about 1.5 mm. long; sheaths glabrous.
Stems creeping. Racemes mostly 2_____6. S. longiflora.
Stems erect, or somewhat geniculate at base_____5. S. chinensis.
Rachis of racemes not winged; that is, the green margins narrower than the central part.
Rachis of racemes beset with scattered long hairs, spreading; sheaths pilose_____2. S. digitata.
Rachis of racemes without long hairs.
Sheaths velvety pubescent; racemes approximate or connivent, not spreading_____3. S. malacophylla.
Sheaths glabrous or the lower puberulent; racemes ascending, loosely approximate_____4. S. cuyabensis.

1. **Syntherisma sanguinalis** (L.) Dulac, Fl. Haut. Pyr. 77. 1867. CRABGRASS.

Panicum sanguinalis L. Sp. Pl. 57. 1753.

Digitaria sanguinalis Scop. Fl. Carn. ed. 2. 1: 52. 1772.

Digitaria marginata Link, Enum. Pl. 1: 102. 1821.

Digitaria fimbriata Link, Hort. Berol. 1: 226. 1827.

A decumbent branching weedy grass with pilose sheaths, flat blades, and 5 to 10 racemes in 1 or 2 whorls; spikelets 3 mm. long, the nerves more or less silky-pubescent.

RANGE: A common weed in cultivated soil and waste places throughout the temperate and tropical regions of both hemispheres. Originally described from America and southern Europe.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Promenade Gardens, a weed in flower beds, *Hitchcock* 16576. Rockstone, a weed along railroad, *Hitchcock* 17327. Coast lands, *Jenman* 4373*, 6036½.

2. **Syntherisma digitata** (Swartz) Hitchc. Contr. U. S. Nat. Herb. 12: 142. 1908.

Milium digitatum Swartz, Prodr. Veg. Ind. Occ. 24. 1788.

Digitaria horizontalis Willd. Enum. Pl. 92. 1809.

Digitaria setigera Roth; Roem. & Schult. Syst. Veg. 2: 474. 1817.

Digitaria setosa Desv.; Hamilt. Prodr. Pl. Ind. Occ. 6. 1825.

Similar to the preceding, but the racemes more slender, averaging more numerous; spikelets narrow, about 2.3 mm. long, the nerves glabrous or nearly so; rachis of racemes beset with scattered long hairs, these glistening when moist with dew.

RANGE: A common weed in fields, open ground, and waste places, tropical regions of both hemispheres. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Georgetown, a weed, *Hitchcock* 16603. Kyk-over-al Island, a weed, *Hitchcock* 17200. Tumatumari, *Hitchcock* 17344; *Gleason* 43. Akyma, *Hitchcock* 17436. Morawhanna, a weed in the grounds of Commissioner King, *Hitchcock* 17474. Essequibo River, *Jenman* 1092*. Coast region, *Jenman* 1511*, 4545, 6036. Upper Demerara River, *Jenman* 4108, 4111. Also *Meyer*, a fragment from a specimen in the Trinius Herbarium labeled "Fl. Esseq."

3. **Syntherisma malacophylla** Hitchc., sp. nov. FIG. 79.

Plants annual; culms erect, glabrous, or the lower internodes pilose, 50 to 100 cm. tall; sheaths softly and densely pilose, the uppermost glabrous; ligule a thin brownish membrane about 2 mm. long; blades flat, spreading, 10 to 15 cm. long, 5 to 8 mm. wide, softly pubescent on both surfaces, the uppermost glabrous; inflorescence long-exserted; racemes about 10 to 12, 10 to 15 cm. long, erect, the axis 3 to 4 cm. long; rachis of the racemes angled, the margin scabrous, much narrower than the white center; spikelets about 2.5 mm. long, the longer pedicel of the pair angled, 1 to 2 mm. long; first glume obsolete; second glume as long as the spikelet, 5-nerved, a little silky on the margin and along the lower part; sterile lemma similar to the second glume, 7-nerved, the 3 nerves on each side close together near the margin, appressed silky-villous; fertile lemma pale, apiculate, as long as the spikelet.

Type in the U. S. National Herbarium, no. 1,038,515, collected in nearly pure sand along the railroad at Rockstone, British Guiana, December 31, 1919, by A. S. Hitchcock (no. 17284).

Known only from the type collection.

FIG. 79.—*Syntherisma malacophylla.* From the type specimen.

4. Syntherisma cuyabensis (Trin.) Hitchc.

Panicum cuyabense Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 1: 206. 1834.

A spreading annual, with culms as much as 1 meter long; sheaths glabrous or the lower pubescent; blades flat, more or less scabrous or pubescent; spikes several or numerous, ascending, aggregate near the summit but not digitate, slender, as much as 10 cm. long, the rachis scarcely winged, naked; spikelets about 2.5 mm. long, narrowly lanceolate, short-pubescent on the nerves, the first glume obsolete, the second as long as the spikelet.

RANGE: Sandy soil, Guiana to Argentina. Originally described from Brazil.

SPECIMEN FROM BRITISH GUIANA: Rockstone, *Gleason* 636.

5. Syntherisma chinensis (Nees) Hitchc.

Paspalum chinense Nees in Hook. & Arn. Bot. Beechey Voy. 231. 1841.

Paspalum minutiflorum Steud. Syn. Pl. Glum. 1: 17: 1854. Not *P. minutiflorum* Desv. 1831.

Syntherisma helleri Nash, Minn. Bot. Stud. 1: 798. *pl. 44.* 1897.

A slender, tufted, erect or ascending annual, leafy below, with flat glabrous blades and 2 to several very slender, usually arcuate racemes of minute pale spikelets obscurely silky in the internerves.

In Grasses of the West Indies[9] this species was listed as *S. longiflora.*

RANGE: Grassland and open ground, southern Asia, now spread to tropical regions generally. Originally described from China.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, grassland near canal, *Hitchcock* 16548. Akyma, a weed in fields, *Hitchcock* 17437.

6. Syntherisma longiflora (Retz.) Skeels, U. S. Dept. Agr. Bur. Pl. Ind. Bull. 261: 30. 1912.

Paspalum longiflorum Retz. Obs. Bot. 4: 15. 1786.

Digitaria longiflora Pers. Syn. Pl. 1: 85. 1805.

Stems creeping, the fertile culms 10 to 15 cm. tall; blades short and spreading, mostly 10 to 15 mm. long; racemes mostly 2-conjugate at summit, 2 to 3 cm. long; spikelets scarcely 1.5 mm. long.

RANGE: Open clay bank, southern Asia and Polynesia; introduced in British Guiana. Originally described from India.

SPECIMEN FROM BRITISH GUIANA: Hills Estate near Bartica, clay bank beside road, *Hitchcock* 17193.

29. STENOTAPHRUM Trin.

Spikelets 1 to 3 together, embedded in cavities along one side of a broad, flat, thickened, corky, articulate axis, the spikelets falling attached to the joints; spikelets strongly convex on the inner side; first glume minute.

1. Stenotaphrum secundatum (Walt.) Kuntze, Rev. Gen. Pl. 2: 794. 1891.

Ischaemum secundatum Walt. Fl. Carol. 249. 1788.

Stenotaphrum americanum Schrank, Pl. Rar. Hort. Monac. *pl. 98.* 1820.

Stenotaphrum glabrum var. *americanum* Doell in Mart. Fl. Bras. 2[3]: 300. 1877.

An extensively creeping glabrous perennial, the stolons with long internodes and short, leafy branches, the sheaths equitant, the blades short, obtuse; flowering culms 10 to 30 cm. tall, the blades commonly 10 to 15 cm. long; spikes terminal and axillary, 5 to 10 cm. long.

RANGE: Open grassland, at low altitudes, especially near the coast, southern United States to southern Brazil. Originally described from South Carolina.

SPECIMENS FROM BRITISH GUIANA: New Amsterdam, grassy places at rear of mangroves, *Hitchcock* 16821. Without locality, *Jenman* 6019*, 7510.

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[9] Contr. U. S. Nat. Herb. 18: 294. 1917.

An excellent pasture grass. Called St. Augustine grass in the southern United States, where it is used for lawns. In British Guiana sometimes called sheep grass.

30. ECHINOLAENA Desv.

Spikelets tuberculate-hispid, laterally compressed, pectinately arranged in a single, 1-sided, inflexed, spikelike raceme terminating the main culm and the branches; first glume longer than the second.

1. **Echinolaena inflexa** (Poir.) Chase, Proc. Biol. Soc. Washington 24: 117. 1911.

Cenchrus inflexus Poir. in Lam. Encycl. 6: 50. 1804.

Cenchrus marginalis Rudge, Pl. Guian. 19. *pl. 25.* 1805.

Echinolaena hirta Desv. Journ. de Bot. Desv. 1: 75. 1813.

Echinolaena scabra H. B. K. Nov. Gen. & Sp. 1: 118. *pl. 38.* 1816.

Panicum echinolaena Nees, Agrost. Bras. 128. 1829.

A much-branched decumbent and straggling perennial, the stiff branches erect; blades firm, smooth, 4 to 6 cm. long; raceme 2 to 3 cm. long, usually bent at right angles, the upper spikelet extending forward as a continuation of the rachis.

RANGE: Moist open ground, Guiana to Brazil. Originally described from Cayenne.

SPECIMENS FROM BRITISH GUIANA: Lama Stop-off, shady bank of canal, *Hitchcock* 16898; *Bartlett* 8108. Spencers Landing, County Berbice (Cattle-trail Survey), *Abraham* 173. Mt. Roraima, "our house," *Im Thurn* 154. Canje River, *Jenman* 1901*. Lama Savanna, *Jenman* 5974. Without locality, *Schomburgk* 646.

31. PSEUDECHINOLAENA Stapf.

Spikelets loosely arranged in several erect or ascending racemes, the second glume about as long as the spikelet, uncinate-spiny and ventricose at maturity.

1. **Pseudechinolaena polystachya** (H. B. K.) Stapf in Prain, Fl. Trop. Afr. 9: 495. 1919.

Echinolaena polystachya H. B. K. Nov. Gen. & Sp. 1: 119. 1816.

Panicum uncinatum Raddi, Agrost. Bras. 41. 1823.

Plants creeping and rooting at base, the fertile culms erect or ascending, 20 to 40 cm. tall; blades thin, elliptic, 3 to 6 cm. long; racemes 2 to 3 cm. long.

RANGE: Moist, shady soil, southern Mexico to Bolivia and Uruguay. Originally described from Colombia.

SPECIMEN FROM BRITISH GUIANA: Without locality, *Schomburgk* 588.

32. ERIOCHLOA H. B. K.

Inflorescence of few to many racemes along a common axis; spikelets subsessile, solitary, the back of the fruit turned from the slender rachis; internode of the rachilla between the first and second glumes thickened, forming a ring-like base to the spikelet, the first glume usually reduced to an obscure sheath adnate to the ring; fruit minutely papillose-rugose, mucronate-pointed or with a delicate, often deciduous awn.

Spikelets acute; first glume present ..... 1. E. subglabra.

Spikelets long-acuminate; first glume obsolete.

Fruit tipped with a slender awn 1 mm. long; spikelets 4 to 5 mm. long. ..... 2. E. punctata.

Fruit merely apiculate; spikelets 3 mm. long ..... 3. E. ramosa.

1. **Eriochloa subglabra** (Nash) Hitchc. Contr. U. S. Nat. Herb. **12**: 208. 1909.

Monachne subglabra Nash, Bull. Torrey Club **30**: 374. 1903.

A stoloniferous perennial with erect flowering culms 1 to 2 meters tall, bearded nodes, flat spreading blades, and terminal panicles of several to many loosely ascending or spreading branches, the spikelets usually in pairs.

RANGE: Moist ground, swamps, and ditches, West Indies to Brazil. Originally described from Porto Rico.

SPECIMEN FROM BRITISH GUIANA: Bartica, sandy bank of Essequibo River, *Hitchcock* 17265.

2. **Eriochloa punctata** (L.) Desv.; Hamilt. Prodr. Pl. Ind. Occ. 5. 1825.

Milium punctatum L. Syst. Nat. ed. 10. **2**: 872. 1759.

Plants perennial, branching; culms erect, as much as 1 meter tall or more; blades up to 15 mm. wide; panicles with several erect or ascending racemes; spikelets silky.

RANGE: Swamps and ditches, southern United States, through the West Indies and eastern Mexico to Brazil. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Georgetown, a weed in Botanic Gardens, *Hitchcock* 16612. Peters Hall, among brush near river, *Hitchcock* 16669, 16675, 16676. Parika, savanna, *Hitchcock* 16801. Mackenzie, moist grassland, *Hitchcock* 17454. Morawhanna, a weed in the grounds of Commissioner King, *Hitchcock* 17473. Coast region, *Jenman* 2168*, 4374*, 4378, 4430, 4514*. Lama Savanna, *Jenman* 5995, 5996.

3. **Eriochloa ramosa** (Retz.) Kuntze, Rev. Gen. Pl. **2**: 775. 1891.

Milium ramosum Retz. Obs. Bot. **6**: 22. 1791.

Eriochloa annulata Kunth, Rév. Gram. **1**: 30. 1829.

A slender ascending glabrous annual with sparingly branching culms, linear blades 2 to 5 mm. wide, and pale panicles of few to several erect or ascending racemes; spikelets silky.

RANGE: Introduced in British Guiana and Cuba. Originally described from India.

SPECIMEN FROM BRITISH GUIANA: Georgetown, moist open ground, *Hitchcock* 16574.

33. AXONOPUS Beauv.

Inflorescence of 2 to many slender racemes, aggregate at the summit of the culm; spikelets depressed-biconvex, oblong-elliptic, solitary, subsessile, the back of the fruit turned from the rachis; first glume wanting; sterile palea obsolete.

Rachis bearing conspicuous stiff spreading golden hairs (Section CABRERA).

1. A. aureus.

Rachis not bearing stiff hairs (AXONOPUS proper).

Plants annual. Racemes 2 or 3, delicate **2. A. capillaris.**

Plants perennial.

Spikelets 2.5 to 3 mm. long.

Racemes few; spikelets about 3 mm. long, nearly smooth.

3. A. leptostachyus.

Racemes numerous; spikelets about 2.5 mm., appressed-silky.

4. A. scoparius.

Spikelets 2 mm. or less long.

Culms erect in large bunches, 50 to 100 cm. tall, without stolons.

5. A. attenuatus.

Culms creeping or stoloniferous.

Blades averaging more than 5 mm. wide; spikelets 2 mm. long.

6. A. compressus.

Blades mostly less than 3 mm. wide; spikelets less than 2 mm. long.

7. A. stragulus.

1. Axonopus aureus Beauv. Ess. Agrost. 12, 154. 1812.

Paspalum exasperatum Nees, Agrost. Bras. 81. 1829.

Panicum chrysites Steud. Syn. Pl. Glum. 1: 38. 1854.

A tall, slender, branching perennial with wiry, compressed culms, rather firm spreading flat blades, and a handsome inflorescence of 4 to 15 subdigitate, slender, golden-brown racemes, the stiff orange-yellow hairs in tufts below the spikelets, as well as along the margins.

RANGE: Wet, sandy savannas, Porto Rico and Trinidad to Brazil. Type locality not indicated in the original description.

SPECIMEN FROM BRITISH GUIANA: Yawakuri Savanna, County Berbice (Cattle-trail Survey), *Abraham* 143.

2. **Axonopus capillaris** (Lam.) Chase, Proc. Biol. Soc. Washington **24**: 133. 1911.

Paspalum capillare Lam. Tabl. Encycl. 1: 176. 1791.

A slender, ascending, branching, nearly glabrous annual, with thin blades 2.5 to 5 cm. long and about 4 mm. wide and with 2 or 3 delicate racemes about 2.5 cm. long, on long subcapillary peduncles.

RANGE: Moist open ground, Central America to Peru and Brazil. Originally described from tropical America.

SPECIMENS FROM BRITISH GUIANA: Wismar, sandy soil, *Hitchcock* 17276. Hills Estate near Bartica, sandy soil, *Hitchcock* 17192. Rockstone, sandy soil, *Hitchcock* 17299; *Gleason* 636½ (herb. N. Y. Bot. Gard.).

3. **Axonopus leptostachyus** (Flügge) Hitchc.

Paspalum leptostachyum Flügge, Monogr. Pasp. 123. 1810.

Culms erect, branching, as much as 1 meter tall; blades up to 1 cm. wide; racemes mostly 4 to 6 from the main culm, fewer from the branches, as much as 20 cm. long, erect or ascending; spikelets 3 mm. long.

RANGE: Moist open ground, Venezuela to Brazil. Originally described from Venezuela.

SPECIMENS FROM BRITISH GUIANA: Penal Settlement, wet sand along river, *Hitchcock* 17114. Bartica, bank of Essequibo River, *Hitchcock* 17162, 17264; *Jenman* 6028. Tumatumari, in partial shade near river, *Hitchcock* 17364. Potaro, new land made by gold dredge, *Hitchcock* 17408. Rupununi Savanna, *Melville**.

4. Axonopus scoparius (Flügge) Hitchc.

Paspalum scoparium Flügge, Monogr. Pasp. 124. 1810.

An erect perennial a meter or more tall, with hispidulous sheaths, flat, glabrous or hispidulous blades 5 to 20 mm. wide, and numerous slender, erect or ascending racemes 10 to 20 cm. long, aggregate toward the summit of the culm; spikelets 2.5 to 3 mm. long, appressed short-villous.

RANGE: Savannas, Colombia to Ecuador and Brazil. Originally described from tropical America.

SPECIMEN FROM BRITISH GUIANA: Without locality, *Schomburgk* 721.

5. Axonopus attenuatus (Presl) Hitchc.

Paspalum attenuatum Presl, Rel. Haenk. 1: 212. 1830.

Culms numerous in large bunches, erect, 50 to 100 cm. tall, the shoots much compressed; sheaths numerous, overlapping, strongly keeled, passing insensibly into the folded blade; racemes slender, numerous, as many as 20, somewhat scattered for 4 to 5 cm., mostly 7 to 10 cm. long; spikelets about 1.5 mm. long.

The rather stiff and fragile shoots are conspicuously compressed and distichous.

RANGE: Sand scrub and sandy savannas, Guiana to Peru and Brazil. Originally described from Peru.

SPECIMENS FROM BRITISH GUIANA: Head of Horeabea Creek, sandy savanna, *Hitchcock* 16940. Sand scrub between Wismar and Rockstone, *Hitchcock* 17275, 17285. County Berbice (Cattle-trail Survey), "growing sparsely on high plateau composed of white sand," *Abraham* 246. Potaro River, Kaieteur Savanna, *Jenman* 1069*.

6. **Axonopus compressus** (Swartz) Beauv. Ess. Agrost. 12, 154. 1812.

CARPET GRASS.

Milium compressum Swartz, Prodr. Veg. Ind. Occ. 24. 1788.

Paspalum platicaulon Poir. in Lam. Encycl. Suppl. 5: 34. 1804.

Paspalum compressum Raspail, Ann. Sci. Nat. 5: 301. 1825.

Anastrophus compressus Schlecht.; Doell in Mart. Fl. Bras. 2^2: 102. 1877.

A nearly glabrous perennial, under favorable conditions producing long leafy stolons with short broad obtuse blades, the flowering culms erect or ascending, compressed, with rather thin blades 8 to 10 mm. wide, and 2 to 5 slender racemes along a short axis, 2 or 3 secondary peduncles often produced from the upper node.

This species is exceedingly variable in habit; in dry ground it sometimes has blades not over 2 or 3 mm. wide.

RANGE: Moist grassland, southern United States to Argentina; also in the warmer parts of the Old World. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Penal Settlement, sandy ground, *Hitchcock* 17066, 17101. Wismar, sandy soil, *Hitchcock* 17277. Rupununi Savanna, *Melville*. Also *Meyer*, a fragment from a specimen in the Trinius Herbarium labeled "*Paspalum platicaule* Poir. Fl. Esseq."

This species is an important constituent of grassland in the lowland of British Guiana and is an excellent forage grass.

7. **Axonopus stragulus** Chase, sp. nov. FIG. 80.

Plants perennial, forming small dense mats with slender, freely branching stolons as much as 40 cm. long, rooting at the nodes, the internodes strongly flattened, the leaves not noticeably different from those of the flowering culms; flowering culms erect or ascending, often geniculate, 10 to 30 cm. tall, flattened, glabrous, with 1 or 2 slender leafless flowering branches from the upper nodes, the uppermost joints elongate and very slender; nodes appressed-pubescent or glabrous; sheaths usually longer than the internodes but commonly somewhat spreading, exposing the nodes, compressed, keeled, ciliate on the margin, the hairs at the summit as much as 2 mm. long, otherwise glabrous or occasionally sparsely pilose; ligule minute, ciliate; blades erect or slightly divergent, folded at the base or throughout, about as wide as the sheath at base, 2 to 10 cm. long, 2 to 3 mm. wide, the apex carinate, sparsely papillose-pilose on the margin at least toward the base; racemes 2 to 4 (commonly 3), subdigitate, slender, suberect or slightly spreading, 3 to 6 cm. long; rachis about 0.5 mm. wide, flexuous, glabrous; spikelets not at all imbricate, pale, 1.8 mm. long, about 0.7 mm. wide, oblong-elliptic; glume and sterile lemma equal, covering the fruit but not exceeding it, 4-nerved (the midnerve suppressed), the lateral nerves adjacent and near the margin, with a thin band of long appressed silky hairs either side of each pair, this pubescence often obscure, sometimes wanting; fruit pale stramineous, minutely pubescent at the apex.

Type in the U. S. National Herbarium, no. 1,038,951, collected in open, sandy, moist soil along road through forest, near the Penal Settlement, on the west side of Essequibo River, near the mouth of Mazaruni River, British Guiana, December 3, 1919, by A. S. Hitchcock (no. 17065).

Related to *Axonopus compressus* (with which it was found growing), from which it is distinguished by its much more slender habit, by the nearly conform

FIG. 80.—*Axonopus stragulus*. From the type specimen.

foliage of the stolons and fertile culms, by the smaller, less pubescent spikelets, the glume and sterile lemma not pointed beyond the fruit. This may be *Paspalum platycaulon parviflorum* Doell,[10] described from Cayenne.

RANGE: Known only from near the junction of the Mazaruni and Essequibo rivers.

SPECIMENS FROM BRITISH GUIANA: Penal Settlement, moist sandy soil, *Hitchcock* 17065; open shrubby ground, *Hitchcock* 17245; rocks near river, *Hitchcock* 17246. Bartica, *Jenman* 6027.

34. PASPALUM L.

Inflorescence of 1 to many racemes, these conjugate or racemose along a common axis; spikelets plano-convex, subsessile along a slender or winged rachis, the back of the fruit turned toward it; first glume typically wanting, present in a few species; fertile lemma and palea chartaceous-indurate.

Rachis with broad membranaceous wings more or less infolding the spikelets.
Racemes numerous; spikelets glabrous or minutely pubescent---1. P. repens.
Racemes 1 or 2; spikelets pilose.
Raceme 1; spikelets silky; blades involute---2. P. carinatum.
Racemes 2; spikelets papillose-ciliate; blades flat---3. P. pectinatum.
Rachis without broad membranaceous wings.
Spikelets with a broad, stiff lacerate margin---4. P. fimbriatum.
Spikelets not lacerate-margined.
Racemes 2, conjugate, or approximately so, at the summit of the culm, rarely a third below.
Spikelets elliptic or narrowly ovate.
Second glume and sterile lemma glabrous---5. P. vaginatum.
Second glume pubescent---6. P. distichum.
Spikelets suborbicular, broadly ovate, or obovate.
Spikelets sparsely long-silky around the margin. Plants stoloniferous.
7. P. conjugatum.
Spikelets not silky-margined.
Spikelets 1.5 mm. long, some of them sprinkled with globular hairs.
8. P. multicaule.
Spikelets 1.8 to 2.3 mm. long, glabrous.
Spikelets golden-brown, transversely marked with wavy dark lines.
9. P. serpentinum.
Spikelets green or pale, not marked---10. P. pumilum.
Racemes 1 to many, racemose or fascicled on the axis, not conjugate, sometimes some of them in two's but not regularly so.
Second glume wanting. Sterile lemma dark crimson---11. P. pulchellum.
Second glume present.
First glume present on at least one of the pair of spikelets.
12. P. decumbens.
First glume normally wanting (rarely present on occasional spikelets).
Fruit dark brown and polished. Spikelets glabrous; racemes several; plants annual---14. P. melanospermum.
Fruit not dark brown and polished.
Racemes 1 to 3, rarely more.
Spikelets 2 mm. long. Racemes 1 or 2---13. P. nutans.

[10] In Mart. Fl. Bras. 2[3]: 102. 1877.

Spikelets a little over 1 mm. long.
Blades mostly 1 to 3 cm. long; racemes mostly less than 15 mm. long---15. **P. orbiculatum.**
Blades as much as 10 cm. long; racemes over 3 cm. long.
16. P. arenarium.
Racemes numerous, at least more than 5.
Spikelets about 1.3 mm. long, subhemispheric, pubescent.
17. P. paniculatum.
Spikelets over 1.7 mm. long.
Spikelets glabrous.
Rachis scarcely pilose; spikelets 2 to 2.2 mm. long.
18. P. millegrana.
Rachis densely pilose; spikelet 1.8 to 2 mm. long.
19. P. densum.
Spikelets pubescent.
Spikelets obovate, 3 mm. long---20. **P. virgatum.**
Spikelets 1.8 to 2.3 mm. long.
Spikelets elliptic, about 2.2 mm. long--21. **P. coryphaeum.**
Spikelets obovoid about 1.8 mm. long----22. **P. abrahami.**

1. **Paspalum repens** Bergius, Act. Helv. Phys. Math. 7: 129. *pl.* 7. 1762.
Paspalum gracile Rudge, Pl. Guian. 20. *pl. 26.* 1805.
Paspalum fluitans Kunth, Rév. Gram. 1: 24. 1829.

An aquatic or subaquatic perennial, with submerged stem and floating branches buoyed up by the inflated sheaths, with thin, flat blades and with panicles of numerous spreading racemes, the small, flat, elliptic, whitish spikelets in 2 rows on the broad green rachis.

RANGE: In sluggish streams or standing water, southeastern United States to Paraguay. Originally described from Dutch Guiana.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, in water of canal, *Hitchcock* 16526. Yarikita Police Station, floating in Yarikita River, *Hitchcock* 17647. Canje River, *Jenman* 1904. Lamaha, *Jenman* 3855*. Coast region, *Jenman* 4442, 6020. Barima River, *Jenman* 7109*. Without locality, *Schomburgk* 358.

2. **Paspalum carinatum** Humb. & Bonpl.; Flügge, Monogr. Pasp. 65. 1810.

Culms erect, 30 to 50 cm. tall, with numerous involute pilose blades 10 to 15 cm. long; raceme solitary, about 8 cm. long; spikelets appressed-silky.

RANGE: Savannas, Guiana to Brazil and Peru. Originally described from Peru.

SPECIMEN FROM BRITISH GUIANA: Wiruni-Ituni Savannas, County Berbice (Cattle-trail Survey), *Abraham* 83.

3. **Paspalum pectinatum** Nees; Trin. Gram. Icon. 1: *pl. 117.* 1828.

An erect perennial, 30 to 60 cm. tall, with flat pilose blades and 2 conjugate racemes 3 to 6 cm. long; rachis broad and thin; spikelets about 5 mm. long, the sterile lemma pilose on the margin.

RANGE: Savannas, Costa Rica to southern Brazil, whence originally described.

SPECIMEN FROM BRITISH GUIANA: Mt. Roraima, "our house," *Im Thurn* 262.

4. **Paspalum fimbriatum** H. B. K. Nov. Gen. & Sp. 1: 93. 1816.

An erect or ascending annual, 30 to 100 cm. tall, with ciliate sheaths, lax blades, and few to several ascending racemes, the imbricate spikelets with a broad, flat, lacerate, corky wing margin ciliate on the edge.

RANGE: Roadsides and waste places, West Indies and northern South America. Originally described from Colombia.

SPECIMENS FROM BRITISH GUIANA: Georgetown, grassy slope back of sea wall, *Hitchcock* 16836; *Kartright* in 1911.

5. **Paspalum vaginatum** Swartz, Prodr. Veg. Ind. Occ. 21. 1788.

Paspalum distichum var. *vaginatum* Swartz; Griseb. Fl. Brit. W. Ind. 541. 1864.

An extensively creeping perennial with loose sheaths and spreading involute-margined blades 2 to 6 mm. wide, tapering from base to apex, the sterile runners often stout with closely imbricate leaves, the flowering branches ascending, commonly 20 to 30 cm. tall, with a pair of divergent racemes (rarely 3) at the apex, the flat acuminate spikelets usually 3 to 4 mm. long.

RANGE: Sea coasts and brackish sands, Gulf Coast and the West Indies to South America. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Coast region, *Jenman* 4391, 4395, 4522.

6. **Paspalum distichum** L. Syst. Nat. ed. 10. 2: 855. 1759.

Similar to *P. vaginatum*, but the flowering culms commonly taller and more slender and the blades slightly wider and softer; spikelets pubescent on the convex side.

The racemes are not reflexed and the sheaths are not inflated as is often the case in *P. vaginatum*.

RANGE: Ditches and wet (rarely brackish) places, southern United States and West Indies to South America; also in the Old World. The source of Linnaeus' specimen is unknown.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Kitty Village, mud along ditch, *Hitchcock* 16563. Lamaha Canal, *Jenman* 3962. Coast region, *Jenman* 4411*, 4520, 4523, 4586.

7. **Paspalum conjugatum** Bergius, Act. Helv. Phys. Math. 7: 129. *pl. 8.* 1762. SOURGRASS.

An extensively creeping perennial with compressed culms, the suberect flowering branches sometimes 1 meter tall; blades flat, rather thin, up to 20 cm. long, commonly about 8 mm. wide; racemes a pair (rarely a third below), widely divaricate, usually arcuate, slender, commonly 10 to 12 cm. long, the pale yellow flattened imbricate spikelets about 1.5 mm. long, with scant long silky hairs around the margin.

RANGE: Moist ground, Gulf States to Argentina; tropics and subtropics of both hemispheres; throughout the West Indies; one of the commonest grasses of moist savannas and ditch banks, forming extensively and close mats. Originally described from Dutch Guiana.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, grassland, *Hitchcock* 16613. Coast region, *Jenman* 3967, 6006*. Also *Meyer*, a fragment from a specimen in the Trinius Herbarium labeled "Fl. Esseq."

8. **Paspalum multicaule** Poir. in Lam. Encycl. Suppl. 4: 309. 1816.

Paspalum papillosum Spreng. Nov. Prov. Hal. 47. 1819.

A low annual, profusely branching from the base and lower nodes, the sheaths and narrow linear blades pilose or nearly glabrous; racemes a pair at the summit of the culm (rarely solitary), divergent, slender, about 3 cm. long, the minute pale orbicular spikelets irregularly sprinkled with globular hairs, these often wanting on some of the spikelets but present on some on each plant.

RANGE: Moist savannas, especially in sandy soil, Cuba to Bolivia and Brazil, whence originally described.

SPECIMENS FROM BRITISH GUIANA: Penal Settlement, open moist sandy soil, *Hitchcock* 17081, 17104, 17105, 17137. Hills Estate near Bartica, a weed in field, *Hitchcock* 17187. Yawakuri-Ituni Savannas, County Berbice (Cattle-trail Survey), *Abraham* 98.

9. Paspalum serpentinum Hochst.; Steud. Syn. Pl. Glum. 1: 22. 1854.

Densely tufted, with gray-villous foliage and slender erect culms 50 to 60 cm. tall, the long erect stiff blades drying involute; racemes a slightly divergent pair, the spikelets solitary, nearly orbicular, about 2.5 mm. long, golden-brown, transversely marked with dark lines.

RANGE: Wet sandy savannas, Trinidad to Dutch Guiana, whence originally described.

SPECIMEN FROM BRITISH GUIANA: Rupununi Savanna, *Melville*.

10. Paspalum pumilum Nees, Agrost. Bras. 52. 1829.

Densely tufted, leafy at base, forming mats, the few slender culms ascending; sheaths and commonly the blades pubescent; racemes 2, approximate, arcuately divergent, the dull oval spikelets about 1.8 mm. long.

RANGE: Moist savannas, Leeward Islands to Uruguay. Originally described from Brazil.

SPECIMENS FROM BRITISH GUIANA: Southeast of Lama Stop-off, near canal, *Hitchcock* 16899, 16973, 17011 (pubescent specimens); 17012 (glabrous specimen). Penal Settlement, open ground in bushes, *Hitchcock* 17028. Bartica, grassland, *Hitchcock* 17260. Hills Estate, near Bartica, grassland, *Hitchcock* 17269. Wismar, sand hills, *Hitchcock* 17280. Akyma, wet grassland, *Hitchcock* 17433. Lama Dam, *Jenman* 6002*, 6015.

11. Paspalum pulchellum Kunth, Mém. Mus. Hist. Nat. Paris. 2: 68. 1815.

Perennial, in dense tufts, the slender simple culms 30 to 75 cm. tall, the pilose linear subinvolute blades clustered at the base, the culm sheaths bladeless or nearly so; racemes 2 or 3, approximate, spreading, 2 to 6 cm. long, the solitary glabrous oval spikelets about 1.8 mm. long; both glumes wanting, the sterile lemma tinged with red, sometimes dark crimson; fruit pale, smooth, and shining.

RANGE: Savannas, West Indies and northern South America. Originally described from Venezuela.

SPECIMENS FROM BRITISH GUIANA: Southeast of Lama Stop-off, sandy dike, *Hitchcock* 16974. Lama Stop-off, *Jenman* 4532. Lama Savanna, *Jenman* 6014.

12. Paspalum decumbens Swartz, Prodr. Veg. Ind. Occ. 22. 1788.

Paspalum pedunculatum Desv.; Poir. in Lam. Encyl. Suppl. 4: 315. 1816.

A freely branching decumbent perennial with slender compressed culms, velvety foliage, the flat blades 5 to 10 cm. long, 5 to 8 mm. wide, and solitary arcuate racemes usually 2 to 3 cm. long, borne on very slender peduncles, these commonly several from the upper sheaths; spikelets obovate, 1.5 mm. long, a small first glume present, the second glume about half the length of the fruit.

RANGE: Shaded banks and wooded slopes, Central America, the West Indies, and northern South America. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Hills Estate, near Bartica, open damp ground in partial shade, *Hitchcock* 17195. Wismar, sandy soil by ditch, *Hitchcock* 17278. Akyma, wet grassland, *Hitchcock* 17421. Mackenzie, wet grassland, *Hitchcock* 17465. Upper Demerara River, *Jenman* 4073.

13. Paspalum nutans Lam. Tabl. Encyl. 1: 175. 1791.

Resembling *Paspalum decumbens*, the culms longer, the foliage not velvety, the racemes sometimes 2 or 3, the spikelets 1.8 mm. long, the first glume wanting, the second nearly as long as the fruit.

RANGE: Shady banks and a weed in fields, Costa Rica and the Lesser Antilles to South America. Originally described from Central America.

SPECIMENS FROM BRITISH GUIANA: Penal Settlement, sandy soil along road in forest, *Hitchcock* 17034, 17083.

14. **Paspalum melanospermum** Desv.; Poir. in Lam. Encyl. Suppl. 4: 315. 1816.

Paspalum olivaceum Hitch. & Chase, Contr. U. S. Nat. Herb. 18: 310. 1917.

A smooth spreading annual, the culms ascending or erect from a decumbent base, 30 to 60 cm. tall, with lax flat blades, and 4 to 6 arcuate ascending racemes 1.5 to 3 cm. long scattered along an axis 3 to 5 cm. long; rachis about 1 mm. wide; spikelets glabrous, 2 mm. long, more or less wrinkled on the flat side.

RANGE: Open moist sandy soil, Guadeloupe to Brazil. Originally described from Cayenne.

SPECIMENS FROM BRITISH GUIANA: Parika, sand near sea, *Hitchcock* 16812. Penal Settlement, open sandy ground, *Hitchcock* 17064, 17102. Kyk-over-al Island, open ground, *Hitchcock* 17198. Wismar, sandhills, *Hitchcock* 17279. Tumatumari, open clay ground, *Hitchcock* 17339; *Gleason* 24. Rockstone, *Gleason* 635. Akyma, grassland, *Hitchcock* 17427, 17438. Morawhanna, weed in garden, *Hitchcock* 17470. Essequibo River, *Jenman* 994*, 1093*. Coast region, *Jenman* 1509*, 1518*. Lamaha, *Jenman* 3862. Lama, *Jenman* 6004. Without locality, *Jenman* 6003.

In the account of the Grasses of the West Indies [11] the name *P. melanospermum* was applied to a different species having solitary spikelets on a wider rachis. Subsequent collections from British Guiana show that the form described as *P. olivaceum* is an annual and that it is common there; therefore it is very probable that it is *P. melanospermum*, which was described from Cayenne, though the description is inadequate.

15. **Paspalum orbiculatum** Poir. in Lam. Encyl. 5: 32. 1804.

Paspalum pusillum Vent.; Flügge, Monogr. Pasp. 100. 1810.

A glabrous creeping perennial with ascending flowering branches 10 to 20 cm. tall, the delicate culms finally branching; blades flat, spreading, mostly 1.5 to 4 cm. long, 4 to 7 mm. wide; racemes 2 or 3, short-exserted, 4 to 5 mm. distant, 1 to 2 cm. long, the minute, glabrous, pale yellow, suborbicular spikelets singly disposed.

RANGE: Wet places, southern Mexico and the West Indies to Brazil. Originally described from Porto Rico.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, partly in shallow water, along ditch, *Hitchcock* 16620. Tumatumari, open clay ground, *Hitchcock* 17341. Coast lands, *Jenman* 6005. Barima River, *Jenman* 7101*.

15a. **Paspalum orbiculatum potarense** Chase, subsp. nov.

Differs from *P. orbiculatum* in the larger, oval or ovate instead of orbicular spikelets, 1.2 to 1.3 mm. long, the apex subacute, the midnerve (always suppressed in the species) often developed.

Type in the U. S. National Herbarium, no. 1,039,241, collected at Amatuk Falls, Potaro River, British Guiana, October, 1898, by G. S. Jenman (no. 7481).

Known only from the type specimen. This consists of several plants with the habit of *P. orbiculatum*. Most of the blades are narrower than usual in the species, though occasional specimens of the species have blades quite as narrow. In all the racemes of the type specimen the spikelets are longer and subacute, but the midnerve is developed in less than one-fourth of them and usually not throughout the raceme.

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[11] Contr. U. S. Nat. Herb. 18: 311. 1917.

16. **Paspalum arenarium** Schrad. in Schult. Mant. 2: 172. 1824.

A spreading, often prostrate perennial, the slender culms ascending, 30 to 60 cm. long, with flat pilose blades as much as 12 mm. wide; racemes slender, arcuate, 3 to 6 cm. long, usually 2 on the main culm, one 10 to 15 cm. below the other, usually only 1 on the slender axillary branches; spikelets obovoid, 1.3 mm. long, nearly as wide, slightly pubescent on the convex side.

RANGE: Sandy soil, Guiana to Brazil, whence originally described.

SPECIMENS FROM BRITISH GUIANA: Head of Horeabea Creek, sandy savanna, *Hitchcock* 16934, 16957. Penal Settlement, sandy moist soil by road in forest, *Hitchcock* 17082, 17087. Wismar, sand hills, *Hitchcock* 17282. Demerara River, *Jenman* 4585*. Rockstone, *Gleason* 634.

17. **Paspalum paniculatum** L. Syst. Nat. ed. 10. 2: 855. 1759.

A weedy branching perennial, commonly a meter or more tall, the foliage harshly pubescent, the flat blades 20 to 30 cm. long, about 1.5 cm. wide; racemes very numerous, slender, crowded in an oblong panicle, the minute crowded subhemispheric spikelets pubescent.

Exceedingly variable in size and in the amount of pubescence.

RANGE: Savannas, open or partly shaded, mostly moist ground, Mexico and the West Indies to Brazil. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Hills Estate, near Bartiça, weed in old field, *Hitchcock* 17190. Mackenzie, moist grassland, *Hitchcock* 17460. Demerara River, *Jenman* 4587*. Lama, *Jenman* 5966*.

18. **Paspalum millegrana** Schrad. in Schult. Mant. 2: 175. 1824.

In large strong-rooted clumps, commonly 1.5 meters tall; lower sheaths nodulose, much overlapping; blades partially conduplicate, narrower, stiffer, and more scabrous than those of *P. virgatum*, often finely pubescent on the upper surface; racemes usually numerous, rather aggregate, ascending, the glabrous paired crowded spikelets usually glaucous-purplish or lead color, 2 to 2.2 mm. long, obovate-suborbicular, sometimes almost obcordate and apiculate.

RANGE: Open, mostly moist ground, Bahamas and the Greater Antilles to southern Brazil. Originally described from Brazil.

SPECIMENS FROM BRITISH GUIANA: Mahaica, along coast, *Hitchcock* 16781. New Amsterdam, along ditch, *Hitchcock* 16819. Morawhanna, along water front, *Hitchcock* 17477.

19. **Paspalum densum** Poir. in Lam. Encycl. 5: 32. 1804.

Like *Paspalum millegrana* in habit, the culms and sheaths more lush and in drying more strongly nodulose; racemes 4 to 6 cm. long, very numerous, aggregate in an elongate-pyramidal panicle, the rachises conspicuously pilose, the light brown, glabrous, densely crowded spikelets 1.8 to 2 mm. long, nearly as broad.

RANGE: Wet savannas and open wet ground, West Indies and Panama to Guiana. Originally described from Porto Rico.

SPECIMENS FROM BRITISH GUIANA: Parika, wet savanna, *Hitchcock* 16816. Lamaha, banks, *Jenman* 3656, 5967*.

20. **Paspalum virgatum** L. Syst. Nat. ed. 10. 2: 855. 1759.

A robust perennial growing in large clumps, the erect culms commonly 2 meters tall, the lower sheaths nodulose in drying; blades commonly 50 cm. long or more, 1 to 2 cm. wide, flat, the margins very scabrous; racemes several to many, 5 to 12 cm. long, forming a panicle 20 to 40 cm. long; spikelets in pairs, crowded, grayish, becoming rusty brown at maturity, obovate, 3 mm. long, 2 mm. wide, silky-hairy around the margin.

RANGE: Banks and slopes, mostly moist and swampy ground, Mexico and the West Indies to Argentina. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, along canal. *Hitchcock* 16552. Tumatumari, open moist ground, *Hitchcock* 17336; *Gleason* 34. Lamaha Dam, *Jenman* 3660. Coast lands, *Jenman* 4437, 6199. Rockstone, *Gleason* 649.

21. Paspalum coryphaeum Trin. Gram. Pan. 114. 1826.

I have tentatively referred to this species the specimens mentioned below. A sandy, elevated area along the Mazaruni River below the Penal Settlement, a clearing in the forest giving a fine view of the river, was almost exclusively occupied by this species. The grass had been mowed and no fertile culms were seen, except a single specimen on the bank just below the main area. Long runners are formed, a meter or more in length. Culms erect, about 1 meter tall, pubescent at the nodes; blades erect, as much as 1 cm. wide, villous or the lower surface glabrescent; racemes 8, 6 to 10 cm. long, arcuate, ascending or appressed; spikelets elliptic, about 2.2 mm. long, pubescent.

RANGE: Savannas, Trinidad to Brazil, whence originally described.

SPECIMEN FROM BRITISH GUIANA: Penal Settlement, open ground on hill by river, *Hitchcock* 17238. "Within 30 miles of Georgetown," *Rodway* 32, the specimen in the City Museum of Georgetown.

22. Paspalum abrahami Chase, sp. nov. FIG. 81.

Plants perennial from stout scaly rhizomes, the scales densely pubescent; culms 1 meter tall or more, erect, simple, glabrous; nodes appressed-pubescent; sheaths much overlapping (the lower bladeless), strongly nerved, keeled toward the summit, the keel for about 4 or 5 mm. at the summit densely pilose, sparsely ciliate on the brown hyaline margin, otherwise glabrous, or the lowermost sparsely pubescent, the junction with the blade drying black; ligule brown, membranaceous, lacerate, 2 to 2.5 mm. long; blades erect at the folded base, flat above, some of them 50 cm. long or more, 12 to 14 mm. wide, tapering into a long, twisted, smooth tip, the base scarcely wider than the summit of the sheath, long-ciliate on the margin toward the base and sparsely pilose on the upper surface, glabrous beneath; racemes (in the only plant seen) 6, narrowly ascending, 4 to 10 cm. long, the common axis slender, angled, and with long, erect, white hairs at base and in the axils of the racemes; rachis slender, flexuous, glabrous; spikelets in pairs, on minutely hairy pedicels, crowded, light brown, strongly plano-convex, obovate, 2 mm. long, 1.2 mm. wide; glume and sterile lemma equal, barely covering the fruit, fragile, pilose with white spreading hairs arising from dark bases, the lemma sparsely so, its midnerve suppressed; fruit light brown, smooth, and shining.

Type in the U. S. National Herbarium no. 1,039,242, collected in Yawakuri Savannah, Berbice County, British Guiana, October 6, 1919, by A. A. Abraham (no. 173).

Known only from the type collection. This tall species is not closely related to any thus far described. It is distinguished by its rhizomes, its elongate blades, and by the little hairy mane of the keel at the summit of the sheath.

35. PANICUM L.

Inflorescence paniculate (rarely racemose); spikelets pedicellate, biconvex; first glume present; sterile lemma usually inclosing a hyaline palea, sometimes a staminate flower; fruit chartaceous-indurate, the margins of the lemma inrolled.

Fruit transversely rugose.

Plants annual.

Spikelets glabrous ..... 1. P. reptans.

Spikelets pubescent ..... 2. P. molle.

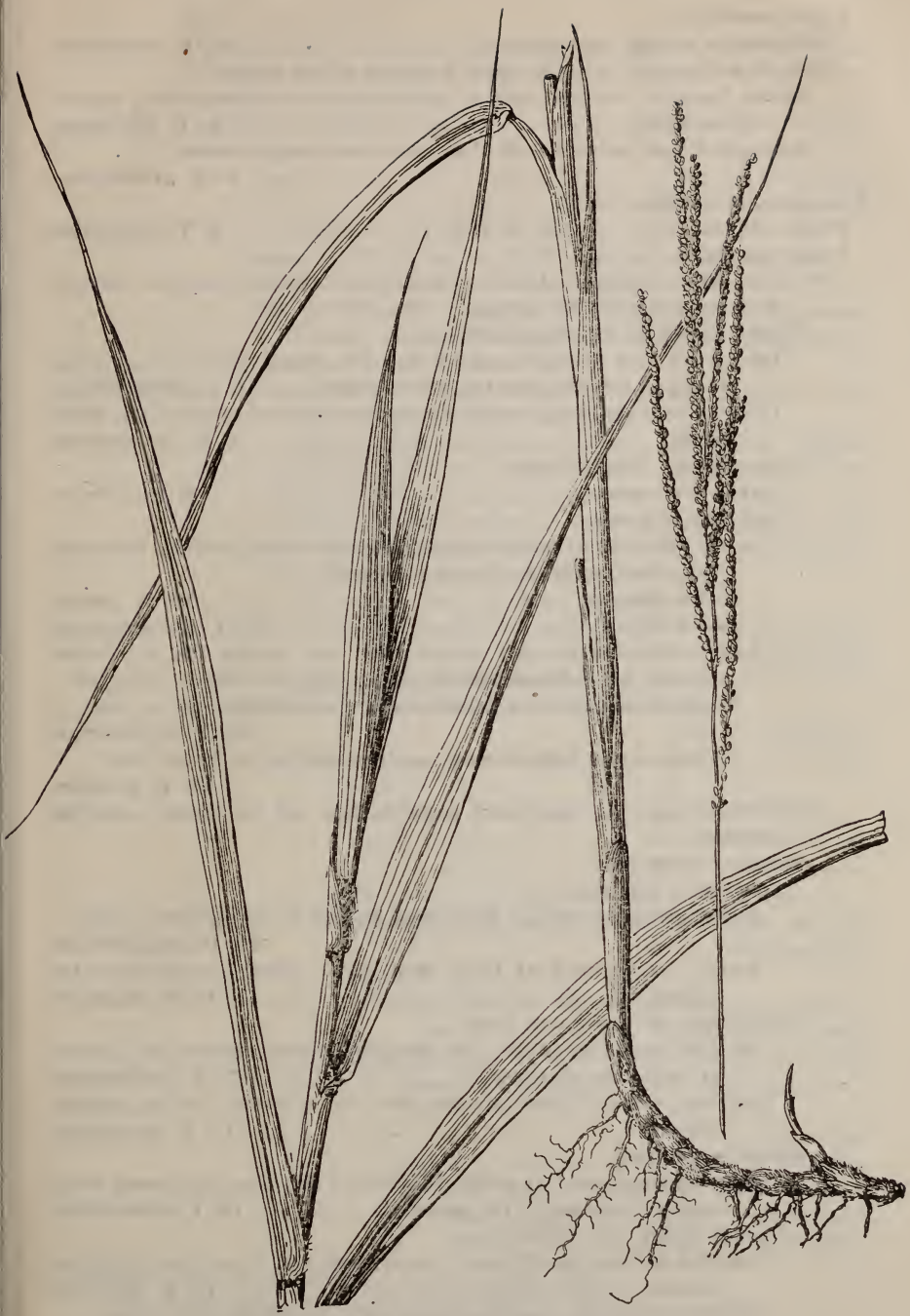

FIG. 81.—*Paspalum abrahami.* From the type specimen.

Plants perennial.
Spikelets in a large open panicle----3. P. maximum.
Spikelets subsessile along the main branches of the panicle.
Nodes bearded; inflorescence of numerous long subfasciculate ascending racemes----4. P. barbinode.
Nodes glabrous; inflorescence of several short erect racemes.
5. P. geminatum.
Fruit not transversely rugose.
Plants annual. (See also nos. 29 and 31)----6. P. trichoides.
Plants perennial.
Spikelets short-pediceled along one side of the panicle branches, forming more or less spikelike racemes. (See also no. 18.)
Blades lanceolate or ovate-lanceolate.
Blades not over 5 cm., usually 2 to 3 cm. long; second glume rather blunt and shorter than the sterile lemma----7. P. stoloniferum.
Blades 5 to 15 cm. long; second glume acute, nearly equaling the sterile lemma----8. P. frondescens.
Blades linear, often elongate.
Spikelets pubescent----9. P. luticola.
Spikelets glabrous.
Lower branches of panicle longer than the upper, bearing secondary branches; spikelets loosely arranged.
Nodes glabrous----10. P. laxum.
Nodes villous----12. P. polygonatum.
Lower branches scarcely longer than any except the uppermost, simple, the rachises usually pilose; spikelets closely arranged.
Culms as much as 1 or 2 meters long; panicles 25 to 30 cm. long.
13. P. milleflorum.
Culms not over 1 meter long; panicles mostly 5 to 15 cm. long.
14. P. pilosum.
Spikelets in open or contracted panicles, but not in 1-sided spikelike racemes.
Spikelets pubescent.
Spikelets 4 mm. long.
Blades cordate-clasping; first glume as long as the spikelet, obtuse.
15. P. asperifolium.
Blades not clasping at base; first glume acute, shorter than the spikelet----16. P. magnum.
Spikelets not over 2 mm. long.
Pedicels much longer than the spikelets; blades rounded or truncate at base, not clasping----17. P. millegrana.
Pedicels, some of them, shorter than the spikelets; blades cordate-clasping----11. P. guianense.
Spikelets glabrous.
Fertile lemma crested at apex. Spikelets 5 mm. long, appressed along the main branches of the panicle----18. P. zizanioides.
Fertile lemma not crested.
Panicles narrow, few-flowered, mostly less than 2 cm. long; spikelets scarcely 1.5 mm. long----19. P. stenodes.
Panicles several to many-flowered, open or diffuse, often large.
Plants succulent. Spikelets acuminate, the first glume about one-fourth as long as the spikelets; large water grasses.
20. P. elephantipes.

Plants not succulent.
Spikelets about 6 mm. long, acuminate; panicle branches elongate, naked below---21. P. olyroides.
Spikelets less than 4 mm. long.
Panicles large, 40 to 60 cm. long, the numerous elongate branches in verticils. Spikelets 3.5 mm. long, globular-ovoid---22. P. megiston.
Panicles usually much less than 40 cm. long, the branches not in verticils.
Blades in a basal cluster, firm, erect, about 30 cm. long.
Spikelets 2 mm. long; blades appressed-villous.
23. P. chnoodes.
Spikelets 3 mm. long; blades glabrous--24. P. eligulatum.
Blades not in a long basal cluster.
Culms robust, rather woody, branching. Spikelets more than 3 mm. long, abruptly pointed.
Sheaths densely hispid---25. P. rudgei.
Sheaths glabrous---26. P. altum.
Culms not robust and branching.
Spikelets viscid, obtuse, 3 mm. long. Blades 15 to 25 mm. wide, lax---27. P. glutinosum.
Spikelets not viscid, less than 2.5 mm. long.
Spikelets acute, about 2 mm. long.
Panicle loosely flowered; pedicels long and flexuous---28. P. pilcomayense.
Panicle densely flowered; pedicels short, some of them shorter than the spikelets.
29. P. hirsutum.
Spikelets subglobose; panicles mostly less than 10 cm. long.
Spikelets not over 1 mm. long; culms filiform.
Blades pilose ---30. P. micranthum.
Blades glabrous ---31. P. polycomum.
Spikelets 1.5 to 2 mm. long; culms not filiform.
Spikelets 2 mm. long. Plants decumbent, spreading---32. P. errabundum.
Spikelets about 1.5 mm. long.
Culms very slender, decumbent or creeping; blades 1 to 3 cm. long--33. P. parvifolium.
Culms firm, erect, or decumbent at the base only; blades mostly more than 3 cm. long.
Blades mostly not over 7 mm. wide.
34. P. cyanescens.
Blades as much as 15 mm. wide and 15 cm. long, the lower sheaths much overlapping, the base of the blade conspicuously clasping---35. P. nervosum.

1. Panicum reptans L. Syst. Nat. ed. 10. 2: 870. 1759.
Panicum grossarium L. Syst. Nat. ed. 10. 2: 871. 1759.
Panicum prostratum Lam. Tabl. Encycl. 1: 171. 1791.
Panicum caespitosum Swartz, Fl. Ind. Occ. 1: 146. 1797.

A spreading annual with culms mostly 20 to 30 cm. long, lanceolate blades as much as 5 cm. long and 1 cm. wide, several ascending racemes as much as 2 cm. long, and glabrous spikelets 2 mm. long.

RANGE: Open ground, at low altitudes, especially near the coast, frequently a weed in waste places and cultivated soil, Gulf Coast of the United States and Atlantic slope of Mexico, throughout the West Indies to northern South America; also introduced in the warm regions of the Eastern Hemisphere. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, weed in flower beds, *Hitchcock* 16605. Without locality, *Jenman* 6024.

2. **Panicum molle** Swartz, Prodr. Veg. Ind. Occ. 22. 1788.

Panicum velutinosum Nees, Agrost. Bras. 121. 1829.

A spreading annual as much as 1 meter tall, with pubescent nodes, blades as much as 15 mm. wide, several ascending racemes as much as 3 cm. long, and pubescent pointed spikelets about 3.5 mm. long, with cross veins between the nerves.

RANGE: Open ground, often a weed in fields, Cuba, Jamaica, Mexico, and Central America to Argentina. Originally described from the West Indies.

SPECIMEN FROM BRITISH GUIANA: Without locality, *Schomburgk* 684.

3. **Panicum maximum** Jacq. Coll. Bot. 1: 76. 1786. GUINEA GRASS.

Panicum polygamum Swartz, Prodr. Veg. Ind. Occ. 24. 1788.

Panicum jumentorum Pers. Syn. Pl. 1: 83. 1805.

A tufted erect perennial as much as 2 meters tall, sometimes taller, with pubescent nodes and a large open panicle of green oblong glabrous spikelets 3 mm. long.

RANGE: A native of tropical Africa, commonly cultivated in the American tropics at low altitudes, often escaped and spontaneous, but infrequent in British Guiana.

SPECIMEN FROM BRITISH GUIANA: Near Bartica, spontaneous on Hills Estate, *Hitchcock* 17176.

4. **Panicum barbinode** Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 1: 256. 1834. PARÁ GRASS.

A tall perennial with long branching decumbent bases, pubescent nodes, glabrous blades, several racemes on an axis 15 to 20 cm. long, the lower as much as 5 to 10 cm. long and more or less branching, and glabrous spikelets 3 mm. long.

RANGE: Cultivated and waste grounds at low altitudes, especially in moist places, tropical America, where it appears to be introduced, probably from Africa. Originally described from Brazil.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Peters Hall, moist ground back of sea dike, *Hitchcock* 16670. Akyma, wet clearing among bushes, *Hitchcock* 17439. Pomeroon River, *Bartlett* 8011. Coast lands, *Jenman* 1517*, 4541*, 5997, 5998.

5. **Panicum geminatum** Forsk. Fl. Aegypt. Arab. 18. 1775.

Paspalum appressum Lam. Tabl. Encyl. 1: 176. 1791.

A glabrous tufted perennial with numerous culms usually 25 to 80 cm. tall, narrow panicles 12 to 30 cm. long, with appressed racemes 1 to 3 cm. long, and glabrous spikelets a little over 2 mm. long.

RANGE: Moist ground or in shallow water, mostly near the coast, southern Florida and Texas to Brazil and Peru; also in the warmer parts of the Old World. Originally described from Egypt.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, mud or shallow water along canal, *Hitchcock* 16528. Lamaha, *Jenman* 3969. Coast region, *Jenman* 4372, 4438, 6021, 6022.

This species has been incorrectly referred to *Panicum paspalodes* Pers.

6. Panicum trichoides Swartz, Prodr. Veg. Ind. Occ. 24. 1788.

A branching annual 20 to 40 cm. tall, with thin lanceolate acuminate blades 1 to 2 cm. wide, delicate open panicles 5 to 20 cm. long, and long-pediceled, sparsely hirsute spikelets a little over 1 mm. long.

RANGE: Woods and open ground, often a weed in cultivated soil, Mexico and the West Indies to Brazil and Ecuador. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Promenade Gardens, *Hitchcock* 16598. Akyma, wet grassland, *Hitchcock* 17431. Issorora, a weed in clearing on hill, *Hitchcock* 17547. Aruka River, *Bartlett* 8577. Demerara, coast region, *Jenman* 4403. Tumatumari, *Gleason* 322.

This species has been incorrectly referred to *Panicum brevifolium* L.

7. Panicum stoloniferum Poir. in Lam. Encycl. Suppl. 4: 274. 1816.

A creeping, freely branching perennial, with fertile branches 10 to 30 cm. tall, lanceolate blades 3 to 15 mm. wide, panicles 1 to 5 cm. long, several spreading racemes 5 to 10 mm. long, and glabrous spikelets 2.5 mm. long.

RANGE: Woods and low ground, Guatemala to Brazil and Ecuador. Originally described from Cayenne.

SPECIMENS FROM BRITISH GUIANA: Rockstone, wet place near river, *Hitchcock* 17314. Portage between Aruau and Yarikita rivers, open ground in shade along trail, *Hitchcock* 17590. Pomeroon River, *Jenman* 1999*. Mt. Russell District, *Jenman* 2106*. Upper Demerara River, *Jenman* 4081. Barima River, *Jenman* 7079*. Tumatumari, *Gleason* 290.

8. Panicum frondescens Meyer, Prim. Fl. Esseq. 56. 1818.

Culms ascending from a decumbent or creeping base, 30 to 50 cm. tall, the lanceolate blades 12 to 30 mm. wide; racemes numerous and crowded, the lower as much as 25 mm. long; spikelets glabrous, 2.5 to 2.8 mm. long.

RANGE: Moist ground, Mexico to Brazil and Peru. Originally described from "Arouabisch" Island, British Guiana.

SPECIMENS FROM BRITISH GUIANA: Potaro, new ground from gold dredge, *Hitchcock* 17410. Akyma, wet place near river, *Hitchcock* 17446. Mackenzie, wet ground near river, among bushes, *Hitchcock* 17461. Morawhanna, back of mangroves, *Hitchcock* 17493. Issorora, wet forest, *Hitchcock* 17568, 17588. Barima River, *Jenman* 7115.

9. Panicum luticola Hitchc., sp. nov. FIG. 82.

Plants perennial; culms erect, or decumbent at base, glabrous, 40 to 60 cm. tall; sheaths glabrous, shorter than the internodes, ciliate on the margin; ligule a very short ciliate membrane; blades ascending or appressed, 5 to 12 cm. long, 4 to 7 mm. wide, rounded or truncate at base or the upper somewhat cordate, glabrous beneath, minutely scabrous above and on the margin; panicle contracted, 8 to 15 cm. long, the branches appressed, the lower 2 or 3 distant; spikelets about 1.3 mm. long, rather blunt, minutely pubescent, nearly sessile, rather loosely and irregularly arranged along one side of the axis of the main branches; first glume about half as long as the spikelet; second glume and sterile lemma about equal, slightly exceeding the fruit, the lemma with a well-developed palea; fertile lemma elliptic, acute.

Type in the U. S. National Herbarium, no. 1,038,962, collected on a tidal flat along the Mazaruni River at the Penal Settlement, British Guiana, December 5, 1920, by A. S. Hitchcock (no. 17113).

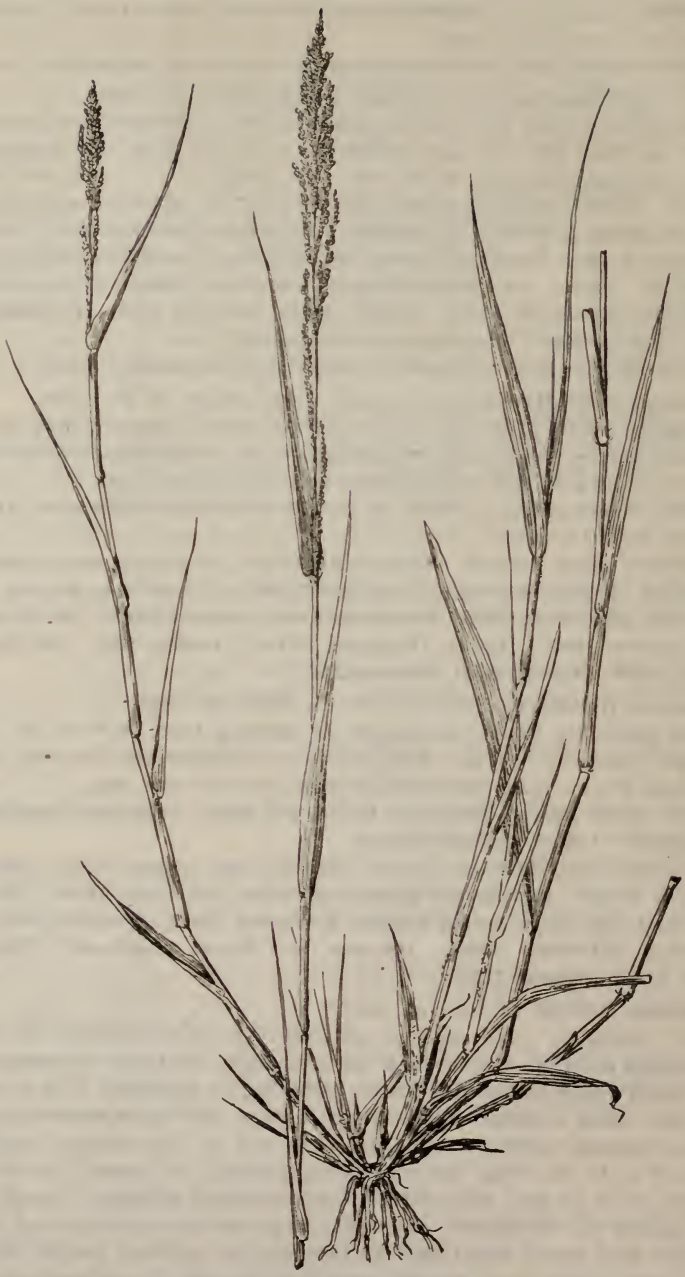

FIG. 82.—*Panicum luticola*. From the type specimen.

This species is allied to *Panicum laxum*, from which it differs in the pubescent spikelets and the contracted panicle. At the type locality the plants were nearly or quite covered at high tide and fully exposed at low tide. The water here is fresh or nearly so. This is probably the same as *P. laxum* var. *pubescens* Doell.[12]

10. Panicum laxum Swartz, Prodr. Veg. Ind. Occ. 23. 1788.

Panicum tenuiculme Meyer, Prim. Fl. Esseq. 58. 1818.

Plants more or less spreading or decumbent at base, usually 40 to 60 cm. tall, sometimes taller; panicle open, the spikelets along one side of the spreading main branches; spikelets a little more than 1 mm. long.

RANGE: Ditches and moist open ground, common, Mexico and the West Indies to Paraguay. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, along ditches, *Hitchcock* 16615. East Coast Water Conservancy, along ditch, *Hitchcock* 17024. Tumatumari, open clay ground, *Hitchcock* 17340. Akyma, wet grassland, *Hitchcock* 17424. Morawhanna, wet places, *Hitchcock* 17475. Pomeroon River, *Bartlett* 8009. Essequibo River, *Jenman* 995*, 1132*. Coast region, *Jenman* 4431, 4526, 6007. Lama Savanna, *Jenman* 6008, 6009.

11. Panicum guianense Hitchc., sp. nov. FIG. 83.

Plants perennial; culms slender, erect from a more or less decumbent base, glabrous, 1 to 2 meters tall; sheaths much shorter than the internodes, glabrous, pilose on the collar; ligule a very short ciliate membrane; blades spreading, flat, narrowly lanceolate or oblong-lanceolate, 10 to 15 cm. long, about 1.5 cm. wide, acuminate at apex, cordate-clasping and ciliate at base, glabrous on both surfaces, scabrous on the margin; panicle loose and open, as much as 30 cm. long, the axis glabrous below, scabrous above, the main branches distant, as much as 15 cm. long, the lower single but with short branchlets near the base, the axils slightly pilose, the branchlets short, somewhat appressed; spikelets oval, minutely pubescent, about 1.3 mm. long, short-pediceled and appressed along the branchlets, the pedicels mostly shorter than the spikelet; first glume ovate, nearly half as long as the spikelet; second glume a little shorter than the fertile lemma, this and the sterile lemma about equal; palea of sterile floret well developed; fertile lemma elliptic, acute.

Type in the U. S. National Herbarium, no. 1,038,517, collected along river bank, in or near the water, Rockstone, British Guiana, January 1, 1920, by A. S. Hitchcock (no. 17313).

No specimens except the type collection have been seen.

The species belongs to the *Laxa* group and is most closely allied to *P. boliviense* Hack., from which it differs in the pubescent spikelets and the much taller and more slender culms and larger panicles.

12. Panicum polygonatum Schrad. in Schult. Mant. 2: 256. 1824.

Similar to *P. laxum;* nodes pubescent; blades more or less cordate at base; panicle more branching, the main branches mostly rebranched, the axis with occasional long hairs.

RANGE: Swamps and moist ground, Mexico to Brazil and Paraguay. Originally described from Brazil.

SPECIMENS FROM BRITISH GUIANA: Issorora, wet places near river, *Hitchcock* 17589; *Stockdale* in 1912.

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[12] Mart. Fl. Bras. 2^2: 213. 1877.

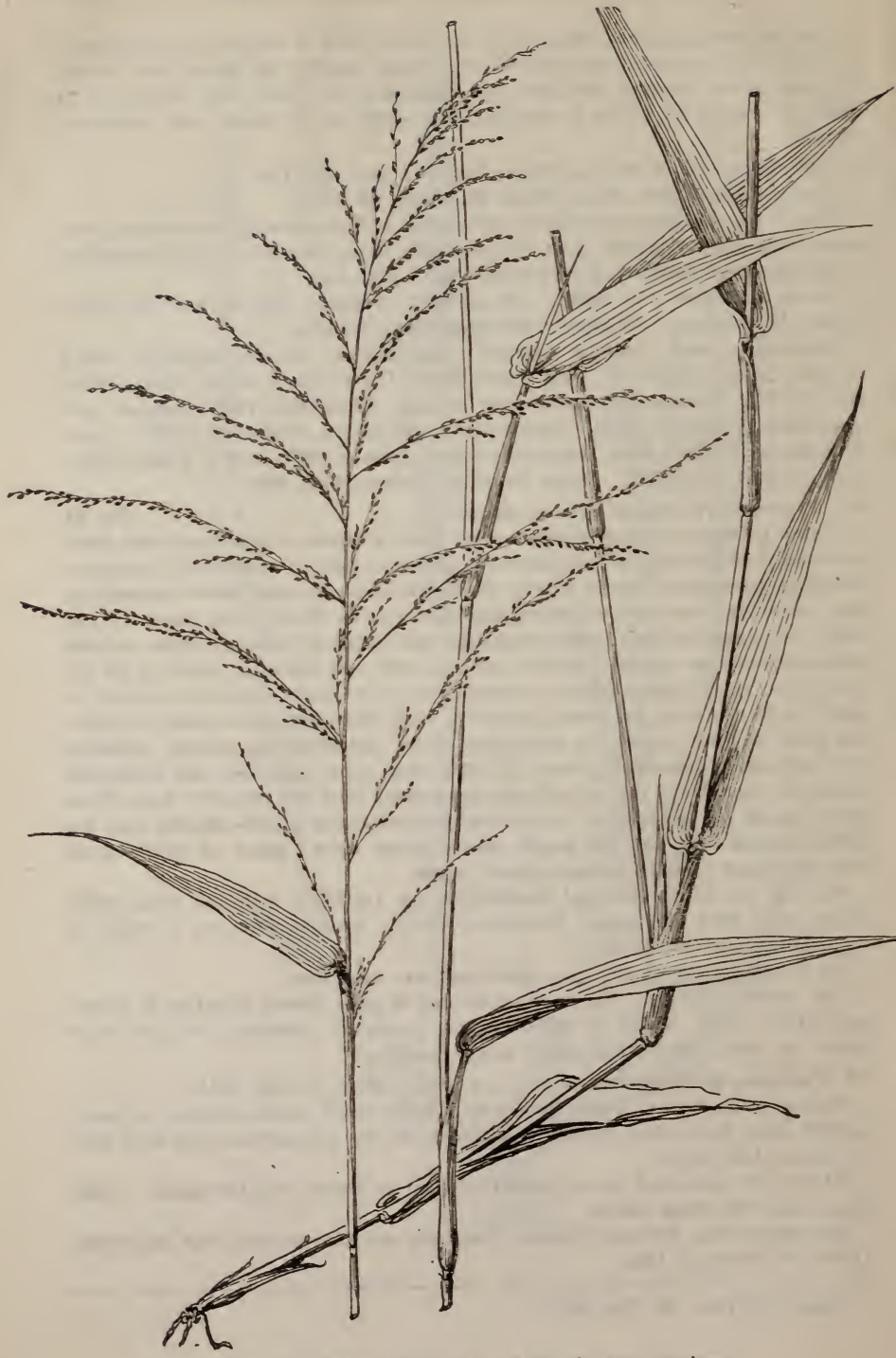

FIG. 83.—*Panicum guianense.* From the type specimen.

13. Panicum milleflorum Hitchc. & Chase, Contr. U. S. Nat. Herb. 17: 494. *f. 70.* 1915.

Resembling *P. pilosum* but larger, the culms as much as 1.5 meters long, creeping and rooting at base; panicle 20 to 35 cm. long.

RANGE: Swamps and wet places, Panama, whence originally described, to Guiana.

SPECIMENS FROM BRITISH GUIANA: Penal Settlement, among bushes in swamp, *Hitchcock* 17172. Rockstone, wet land, *Hitchcock* 17315, 17322. Potaro, new land from gold dredge, *Hitchcock* 17407. Akyma, wet ground near river, *Hitchcock* 17447. Mackenzie, wet ground near river, *Hitchcock* 17463. Issorora, wet field, *Hitchcock* 17585.

14. Panicum pilosum Swartz, Prodr. Veg. Ind. Occ. 22. 1788.

Panicum pilisparsum Meyer, Prim. Fl. Esseq. 57. 1818.

Spreading or ascending, as in *P. laxum;* panicles 5 to 15 cm. long, the numerous dense racemes 1 to 3 cm. long, rather closely arranged along the main axis, the rachises stiffly ciliate; spikelets glabrous, 1.5 mm. long.

RANGE: Moist ground and open woods, Mexico and the West Indies to Brazil. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Peters Hall, low ground along ditch, *Hitchcock* 16671. Parika, savanna, *Hitchcock* 16800. Tumatumari, *Hitchcock* 17338; *Gleason* 930. Akyma, wet grassland, *Hitchcock* 17435. Morawhanna, a weed in field, *Hitchcock* 17483. Short Cut Waini River, *Becket* 8508. Coast region, *Jenman* 1513*. Upper Demerara River, *Jenman* 4024. Lama Creek, *Jenman* 5968. Macaseema, Poomeroon River, *Jenman* 7794. Without locality, *Jenman*, 5969; *Schomburgk* 481, 1224. Rockstone, *Gleason* 621.

15. Panicum asperifolium (Desv.) Hitchc.

Streptostachis asperifolia Desv. Nouv. Bull. Sci. Philom. Paris 2: 190. 1810.

Streptostachys hirsuta Beauv. Ess. Agrost. 50. *pl. 10. f. 11.* 1812.

Panicum streptostachys Spreng. Syst. Veg. 1: 316. 1825.

Panicum balanites Trin. Linnaea 10: 297. 1836.

Plants about 1 meter tall from a decumbent base; sheaths glabrous or hirsute; blades thin, as much as 20 cm. long and 3.5 cm. wide, cordate-clasping; panicle of a few distant spreading branches, the spikelets and branchlets appressed; spikelets 4 mm. long, oblong, obtuse, pubescent, the base hardened and ring-like; first glume as long as the spikelet.

RANGE: Forests, Guiana to Brazil. Described from tropical America.

SPECIMEN FROM BRITISH GUIANA: Without locality, *Schomburgk* 774.

16. Panicum magnum Hitchc., sp. nov. FIG. 84.

Plants perennial, somewhat glaucous, forming large colonies with decumbent bases; culms as much as 5 meters tall and 1.5 cm. thick at base, glabrous; sheaths glabrous, pilose in a line on the collar, the angles at the summit extending upward as an auricle or appendage; ligule a short brown membrane about 1 mm. long; blades narrowly elliptic, as much as 25 cm. long and 3 cm. wide, acuminate at apex, rounded at the narrowed base, scabrous on the upper surface and paler beneath; panicle ellipsoid, as much as 30 cm. long and 10 cm. wide, the branches ascending, the middle ones about 7 cm. long, puberulent and pilose at base, the spikelets and short branchlets ascending along the main branches, somewhat 1-sided; spikelets about 4 mm. long, minutely scaberulous-pubescent or roughened, the pedicels scaberulous; first glume rather more than half as long as the spikelet, the thin, tawny margin often sparsely beset with long hairs (these sometimes as much as 5 mm. long), several-nerved, the principal nerves 5; second glume and sterile lemma equal, several-nerved, the

FIG. 84.—*Panicum magnum*. From the type specimen.

apex slightly incurved, that of the sterile lemma often sparsely villous; sterile floret staminate, the palea well developed; fertile lemma a little shorter than the spikelet, elliptic, acute.

Type in the U. S. National Herbarium, no. 1,038,505, collected in rich soil along edge of forest, about 3 miles southwest of Bartica, British Guiana, December 10, 1919, by A. S. Hitchcock (no. 17194).

The plant has the aspect of a species of *Lasiacis*, but the culms are not woody, the spikelets are not strongly oblique on the pedicels, and the fruit is not shaped as in that genus. Unsupported stems may be as much as 5 meters long, while clambering culms may reach as high as 10 meters.

RANGE: Lowland forest, British Guiana.

SPECIMENS FROM BRITISH GUIANA: Hills Estate near Bartica, edge of forest, *Hitchcock* 17194. Bartica, along road through virgin forest, *Hitchcock* 17250; *Jenman* 2510, 2461*. Mt. Russell District, *Jenman* 2088*. Mazaruni River, *Jenman* 7620.

17. **Panicum millegrana** Poir. in Lam. Encycl. Suppl. 4: 278. 1816.

Panicum rugulosum Trin. Gram. Pan. 195. 1826.

Plants perennial, spreading; culms as much as 1 meter tall; blades thin, as much as 15 cm. long and 3 cm. wide, pubescent or glabrate; panicle loose and open, rather few-flowered; spikelets a little over 2 mm. long, glabrous or (in our specimen) pubescent.

RANGE: Damp woods, Cuba and Mexico to Brazil. Originally described from Cayenne.

SPECIMEN FROM BRITISH GUIANA: Courantyne River, Orealla, *Jenman* 197.

18. **Panicum zizanioides** H. B. K. Nov. Gen. & Sp. 1: 100. 1816.

Panicum oryzoides Swartz, Prodr. Veg. Ind. Occ. 23. 1788. Not *P. oryzoides* Ard. 1764.

Acroceras oryzoides Stapf in Prain, Fl. Trop. Afr. 9: 622. 1920.

Plants branched, decumbent and rooting at base, forming a tangle; fertile culms 30 to 60 cm. tall, sometimes taller; blades cordate-clasping, 5 to 15 cm. long, usually 1 to 2 cm. wide; panicle of a few ascending distant branches, the spikelets and short branchlets appressed along these; spikelets 5.5 to 6 mm. long, glabrous, pointed, the first glume nearly as long as the spikelet; fertile lemma with a little appendage or crest at the apex.

RANGE: Moist places, tropical regions of both hemispheres. Originally described from Colombia.

SPECIMENS FROM BRITISH GUIANA: Parika, boggy place, *Hitchcock* 16758. Kyk-over-al Island, back of beach, *Hitchcock* 17199. Tumatumari, near river, *Hitchcock* 17343; *Gleason* 32. County Berbice (Cattle-trail Survey), banks of Yawakuri River, *Abraham* 196. Coast region, *Jenman* 1510*. Kalacoon, *Jenman* 3610. Lamaha, *Jenman* 3857*. Lamaha Dam, *Jenman* 6001. Rupununi Savanna, *Melville*. Without locality, *Schomburgk* 539, 768. Rockstone, *Gleason* 639.

19. **Panicum stenodes** Griseb. Fl. Brit. W. Ind. 547. 1864.

Plants perennial, tufted, the culms erect, stiff and wiry, 25 to 50 cm. tall, the narrow blades appressed; panicle narrow and few-flowered, 1 to 2 cm. long; spikelets about 1.5 mm. long, glabrous.

RANGE: Borders of ponds and in wet savannas, West Indies and Costa Rica to Brazil. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Lama Stop-off, sandy soil on dike, *Hitchcock* 16900; *Jenman* 4534. Lama Dam, *Jenman* 6025.

20. Panicum elephantipes Nees, Agrost. Bras. 165. 1829.

Plants perennial, with long decumbent or creeping rooting base; culms succulent, as much as 2 cm. thick, 1 to 2 meters tall or more, the nodes black in drying; panicle large and open; spikelets narrow, acute, 4 to 5 mm. long, the first glume less than half as long.

RANGE: Ponds and shallow water, sometimes forming floating islands, West Indies and southern Mexico to Argentina. Originally described from Brazil.

SPECIMENS FROM BRITISH GUIANA: Morawhanna, along river, *Hitchcock* 17469. Above Issorora, in water of river, *Hitchcock* 17659½. Pomeroon River, *Jenman* 1618*. Demerara River, *Jenman* 5977*. Berbice, *Jenman* 6463. Barima River, *Jenman* 7064. Rockstone, *Gleason* 891.

21. Panicum olyroides H. B. K. Nov. Gen. & Sp. 1: 102. 1816.

Plants perennial, erect, 50 to 100 cm. tall, the sheaths overlapping, the blades firm; panicle large and open, 20 to 30 cm. long, the numerous stiff branches slender and naked below; spikelets rather few and large, on slender pedicels, disposed toward the ends of the branches, fusiform, acuminate, 6 to 7 mm. long.

RANGE: Savannas, Venezuela to Brazil. Originally described from Venezuela.

SPECIMEN FROM BRITISH GUIANA: Yawakuri Savanna, County Berbice (Cattle-trail Survey), *Abraham* 177.

22. Panicum megiston Schult. Mant. 2: 248. 1824.

Panicum altissimum Meyer, Prim. Fl. Esseq. 63. 1818. Not *P. altissimum* DC. 1817.

A tall robust perennial with long creeping base, the flowering culms 1 to 2 meters tall; panicle 40 to 60 cm. long, open, the stiff main branches in distant verticils; spikelets globular-ovoid, about 3.5 mm. long, glabrous, the first glume scarcely one-third as long as the spikelet.

RANGE: Swamps and moist ground, Mexico and Cuba to Paraguay. Originally described from British Guiana.

SPECIMEN FROM BRITISH GUIANA: Bartica, marshy place, *Hitchcock* 17261.

23. Panicum chnoodes Trin. Gram. Pan. 211. 1826.

Culms erect, 40 to 60 cm. tall, with a cluster of stiff basal blades, densely appressed-villous, especially toward the base, and with a hard sharp point; panicle ovoid, many-flowered, open, about 10 cm. long, the spikelets ovoid, 2 mm. long, glabrous.

RANGE: Savannas, Guiana to Brazil, whence originally described.

SPECIMEN FROM BRITISH GUIANA: Mt. Roraima, 1,050 meters, *McConnell & Quelch* 709.

24. Panicum eligulatum N. E. Brown, Trans. Linn. Soc. II. Bot. 6¹: 73. 1901.

Resembling *P. chnoodes*, but the scabrous blades glabrous except toward base; panicles smaller and narrower, the spikelets 3 mm. long.

RANGE: Rocky soil. Known only from Mt. Roraima.

SPECIMEN FROM BRITISH GUIANA: Summit of Mt. Roraima, *McConnell & Quelch* 675.

25. Panicum rudgei Roem. & Schult. Syst. Veg. 2: 444. 1817.

Panicum pilosissimum Roth; Roem. & Schult. Syst. Veg. 2: 458. 1817.

A tufted tawny perennial with robust, often zigzag culms as much as 1 meter tall, hirsute sheaths, linear blades, terminal and axillary, open, divaricately spreading panicles, and turgid, abruptly pointed glabrous or sparsely hispid spikelets 3.5 mm. long.

RANGE: Savannas and open ground, British Honduras and Jamaica to Brazil. Originally described from British Guiana.

SPECIMENS FROM BRITISH GUIANA: Hills Estate, near Bartica, old field, *Hitchcock* 17191. Tumatumari, *Hitchcock* 17342; *Gleason* 40. Essequibo River, *Jenman* 2381. Lama, *Jenman* 5978. Macaseema, Pomeroon River, *Jenman* 7814.

26. Panicum altum Hitchc. & Chase, Contr. U. S. Nat. Herb. 17: 488. *f.* 57. 1915.

Plants perennial, reedlike, from a decumbent tangled base, 2 to 4 meters tall, smooth and glaucous; blades 30 to 45 cm. long, 8 to 15 mm. wide; panicle open, 20 to 30 cm. long; spikelets about 3.5 mm. long, glabrous.

RANGE: Sandy marshes or flats near the coast, British Honduras to Guiana. Originally described from Panama.

SPECIMENS FROM BRITISH GUIANA: Parika, moist ground near sea, *Hitchcock* 16795. Penal Settlement, sandy bank of river, *Hitchcock* 17144. Bartica, sandy bank of Essequibo River, *Hitchcock* 17268. Ituribisci Lake, *Jenman* 2261.

27. Panicum glutinosum Swartz, Prodr. Veg. Ind. Occ. 24. 1788.

Culms 1 to 2 meters tall from a decumbent base; panicle 15 to 30 cm. long, open, the spikelets viscid, 3 mm. long, the first glume about as long as the second.

RANGE: Mountain woods, Mexico and the West Indies to Bolivia and Paraguay. Originally described from Jamaica.

SPECIMEN FROM BRITISH GUIANA: Pomeroon River, Waruwaru Creek, *Bartlett* 8124.

28. Panicum pilcomayense Hack. Bull. Herb. Boiss. II. 7: 449. 1907.

An erect perennial about 1 meter tall, with appressed-hispid sheaths, long linear glabrous blades, and an open diffuse panicle with glabrous narrow-pointed brownish spikelets 2 to 2.5 mm. long.

RANGE: Savannas, Guiana to Paraguay, whence originally described.

SPECIMENS FROM BRITISH GUIANA: Without locality, *Schomburgk* 656, 701.

29. Panicum hirsutum Swartz, Fl. Ind. Occ. 1: 173. 1797.

A stout erect perennial as much as 2 meters tall, with hirsute sheaths, flat glabrous blades as much as 2 cm. wide, and large, rather densely flowered panicles, the branches at first ascending, finally spreading; spikelets glabrous, acute, about 2 mm. long.

RANGE: West Indies and central Mexico to northern South America. Originally described from Jamaica.

SPECIMEN FROM BRITISH GUIANA: "Within 30 miles of Georgetown," *Rodway* 60, the specimen in the City Museum of Georgetown.

30. Panicum micranthum H. B. K. Nov. Gen. & Sp. 1: 105. 1816.

A low, densely tufted perennial, much branched at base, with filiform leafy culms about 20 cm. tall, the upper third naked, the blades numerous, pilose, mostly 1 to 3 cm. long, becoming involute; panicles open, mostly 2 to 3 cm. long, with minute glabrous spikelets scarcely 1 mm. long.

RANGE: Sandy savannas, Venezuela to Brazil. Originally described from Venezuela.

SPECIMENS FROM BRITISH GUIANA: Head of Horeabea Creek, sandy savanna, *Hitchcock* 16952. Mt. Roraima, *Loyed* 17*.

31. Panicum polycomum Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 1: 306. 1834.

A low, delicate perennial, with slender culms 10 to 25 cm. tall, glabrous flat blades 1 to 3 cm. long, and small open panicles 2 to 4 cm. long, the glabrous spikelets about 1 mm. long.

RANGE: Savannas, Guiana to Brazil. Originally described from "Guian."

SPECIMENS FROM BRITISH GUIANA: Canester Falls, County Demerara (Cattle-trail Survey), *Abraham* 283. Potaro River, below the Kaieteur, *Jenman* 934, 968*. Tumatumari, *Jenman* 7475. Coast region, *Jenman* 7570.

32. **Panicum errabundum** Hitchc., sp. nov. FIG. 85.

Plants perennial; culms slender, glabrous, branching, decumbent-spreading, as much as 1 meter long; sheaths short, glabrous or more or less papillose-hirsute, the base often bearded; ligule about 2 mm. long, pilose, the base membranaceous; blades oblong-lanceolate, cordate at base, acute, finely pubescent on both surfaces, villous around the base, rather lax, spreading, mostly 3 to 5 cm. long, 5 to 8 mm. wide; panicles short-exserted, about 7 cm. long, nearly as wide, open, the glabrous flexuous capillary branches ascending at about 45°; spikelets oval, glabrous, obtuse, strongly nerved, slender-pediceled, 2 mm. long; first glume two-thirds to three-fourths as long as spikelets; second glume and sterile lemma about as long as the slightly apiculate fertile lemma.

Type in the U. S. National Herbarium, no. 1,038,930, collected in moist savanna, Parika, British Guiana, November 19, 1919, by A. S. Hitchcock (no. 16817). The plants were growing in a tangled mass at the base of bunches of *Paspalum densum*.

A similar species from Misiones, Argentina, with glabrous blades was figured but not described by Ekman [13] under the name *Panicum helobium* Mez.

33. **Panicum parvifolium** Lam. Tabl. Encycl. 1: 173. 1791.

Panicum brasiliense Spreng. Syst. Veg. 1: 321. 1825.

A slender branching, straggling decumbent perennial, the culms rising to a height of 20 to 30 cm., the short blades spreading or reflexed and usually pubescent; panicles small and open, 1 to 3 cm. long; the spikelets about 2 mm. long.

The form found here usually has pubescent blades and is like the type of *P. brasiliense* Spreng. This grades into the typical glabrous form.

RANGE: Savannas and wet places, Central America and the West Indies to Brazil. Originally described from tropical America.

SPECIMENS FROM BRITISH GUIANA: Lama Stop-off, on hummocks at the base of larger plants, marsh, *Hitchcock* 16897. Rockstone, *Gleason* 782, 790; *Hitchcock* 17287. Ituribisci Lake, *Jenman* 2226, 2239. Lamaha, *Jenman* 3861; *Ward* in 1908. Horeabea, *Jenman* 4445. Without locality, *Jenman* 5982; *Schomburgk* 407.

34. **Panicum cyanescens** Nees, Agrost. Bras. 220. 1829.

Resembling *P. parvifolium*, but larger, usually forming distinct tufts with ascending culms 30 to 60 cm. tall; blades mostly appressed, those of the mid-culm about 10 cm. long, 5 to 8 mm. wide; panicles 5 to 10 cm. long.

RANGE: Savannas and swamps, British Honduras to Brazil, whence originally described.

SPECIMENS FROM BRITISH GUIANA: Southeast of Lama Stop-off, sandy dike, *Hitchcock* 16966. Yawakuri Savanna, County Berbice (Cattle-trail Survey), *Abraham* 147, 175. Mt. Roraima, "our house," *Im Thurn* 261. Ituribisci Lake, *Jenman* 2256. Lama, *Jenman* 5985.

35. **Panicum nervosum** Lam. Encycl. 4: 747. 1798.

Panicum commelinaefolium Rudge, Pl. Guian. 21. *pl. 28.* 1805.

Stouter than *P. cyanescens*, the lower sheaths much overlapping; blades strongly nerved, cordate-clasping, widest near the base, gradually narrowing to a sharp point; panicle 10 to 15 cm. long, open, the branches ascending.

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[13] Ark. för Bot. 11[4]: 23. *pl. 1. f. 6.* 1912.

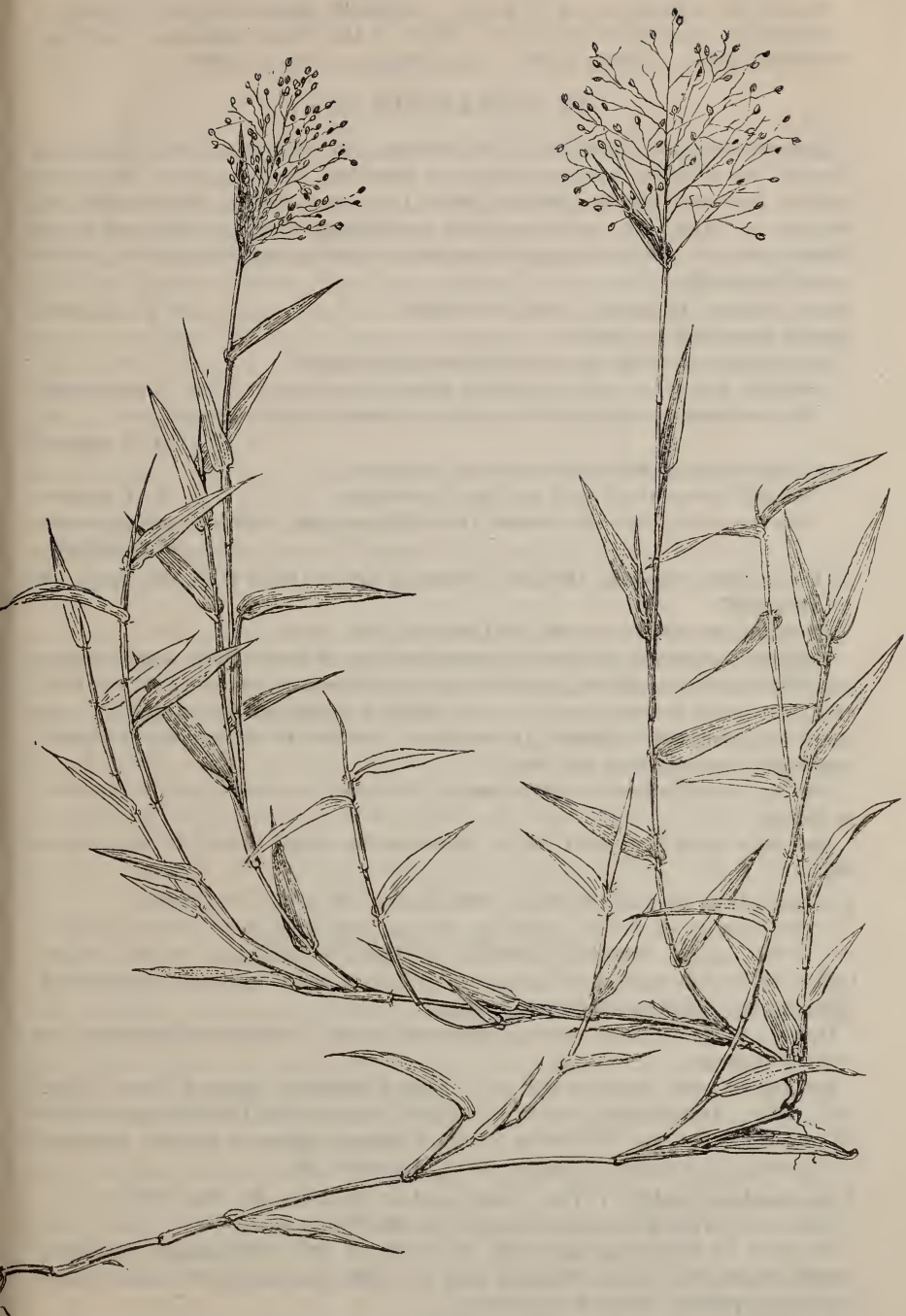

FIG. 85.—*Panicum errabundum*. From the type specimen.

RANGE: Savannas, Guiana to Brazil. Originally described from Cayenne.

SPECIMENS FROM BRITISH GUIANA: Head of Horeabea Creek, sandy savanna, *Hitchcock* 16953; *Jenman* 3725*. Lama Savanna, *Jenman* 5983*.

36. ICHNANTHUS Beauv.

Inflorescence and spikelets as in *Panicum*, the first glume often nearly as long as the spikelets, the fruit acute or subacute, the margins of the lemma usually flat, the rachilla produced below the lemma into a minute stipe, this bearing on either side membranaceous appendages adnate to the base of the lemma and free above, the appendages often wanting and indicated by minute excavations only.

Blades linear. Appendages well developed----------1. I. ichnodes.
Blades lanceolate to elliptic.
Appendages of fertile lemma well-developed wings.
Blades 4 to 7 cm. wide; spikelets about 7 mm. long------2. I. panicoides.
Blades mostly less than 2 cm. wide; spikelets about 6 mm. long.
3. I. riedelii.
Appendages of fertile lemma reduced to scars.
Blades lanceolate, 1 to 2 cm. wide, glabrous----------4. I. pallens.
Blades oval to ovate-lanceolate, 1.5 to 3.5 cm. wide, often pubescent beneath.
5. I. axillaris.

1. Ichnanthus ichnodes (Griseb.) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 335. 1917.

Panicum ichnodes Griseb. Fl. Brit. W. Ind. 551. 1864.

A robust, sparingly branching perennial about 2 meters tall, with pilose or sometimes glabrate sheaths, long flat scabrous blades as much as 2.5 cm. wide, and large many-flowered panicles with whorled, finally spreading branches and blunt long-pediceled spikelets, the wings on the fertile lemma well developed, one-fourth the length of the fruit.

RANGE: Wood borders in partial shade, Trinidad, whence originally described, to Brazil.

SPECIMEN FROM BRITISH GUIANA: Kaieteur Savanna, Potaro River, *Jenman* 902.

2. Ichnanthus panicoides Beauv. Ess. Agrost. 57. *pl. 12. f. 1.* 1812.

Culms solitary or few in a cluster, erect or ascending, the lower part naked, the lower sheaths distant, bladeless, the upper overlapping; blades elliptic, rather thick and firm, 4 to 7 cm. wide, 2 to 3 times as long; panicle few-flowered, the spikelets about 7 mm. long.

RANGE: Floor of virgin forest, Guiana to Brazil. Originally described from tropical America.

SPECIMENS FROM BRITISH GUIANA: Penal Settlement, floor of forest, *Hitchcock* 17121. Tumatumari, *Hitchcock* 17355; *Gleason* 143, 175. Yarikita Police Station, floor of forest, *Hitchcock* 17623. Without number or locality, *Jenman**. Rockstone, *Gleason* 565. Canister Falls, *Abraham* 284.

3. Ichnanthus riedelii (Trin.) Doell in Mart. Fl. Bras. 2^2: 278. 1877.

Panicum riedelii Trin. Gram. Icon. 3. *pl. 323.* 1832.

An erect or ascending perennial, 40 to 80 cm. tall, with falcate, narrowly elliptic blades 8 to 10 cm. long, 1.5 to 2 cm. wide, the panicle of a few distant branches; spikelets about 6 mm. long.

RANGE: Floor of the forest, Guiana to Brazil, whence originally described.

SPECIMENS FROM BRITISH GUIANA: Penal Settlement, sandy floor of forest, *Hitchcock* 17154. Kartabo, floor of forest, *Hitchcock* 17229½. Epira, Courantyne

River, *Jenman* 138*. Kalakoon, Mazaruni River, *Jenman* 2404*. Lama, *Jenman* 5994.

4. Ichnanthus pallens (Swartz) Munro; Benth. Fl. Hongk. 414. 1861.

Panicum pallens Swartz. Prodr. Veg. Ind. Occ. 23. 1788.

Creeping and freely branching, the culms ascending, the flat blades lanceolate, asymmetric, 1 to 2 cm. wide, glabrous; panicles with several ascending branches, terminal and axillary; spikelets 3 to 4 mm. long, glabrous.

RANGE: Rich woods and shady banks, tropics of the Western Hemisphere. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Head of Horeabea Creek, wet forest on sandhills, *Hitchcock* 16933. Near Lama Stop-off, moist woods, *Hitchcock* 16963. Penal Settlement, floor of forest, *Hitchcock* 17152. Kartabo, on old log in clearing in forest, *Hitchcock* 17219. Rockstone, wet forest, *Hitchcock* 17328. Tumatumari, shady moist soil, *Hitchcock* 17335. Issorora, opening in forest. *Hitchcock* 17548, 17557. Yarikita Police Station, shady moist soil, *Hitchcock* 17610. Coast region, *Jenman* 1508*. Essequibo River, *Jenman* 2382*. Without locality, *Schomburgk* 367.

5. Ichnanthus axillaris (Nees) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 334. 1917.

Panicum axillare Nees, Agrost. Bras. 141. 1829.

Similar to *I. pallens*, but the blades wider in proportion to the length, sometimes puberulent on one or both surfaces and the spikelets often sparsely hispid.

In open ground the plants may be robust, as much as a meter tall. On the forest floor the plants may be prostrate and matlike with rounded inflorescence.

RANGE: Moist, more or less shaded slopes. Santo Domingo to Ecuador and Brazil. Originally described from Brazil.

SPECIMENS FROM BRITISH GUIANA: Tumatumari, trail to Washerwomans Fall, floor of forest, *Hitchcock* 17352, 17376. Potaro, on new land from gold dredge, *Hitchcock* 17409, 17411. Akyma, shady bank, *Hitchcock* 17413. Mackenzie, moist open ground, *Hitchcock* 17462. Issorora, edge of forest, in low ground, *Hitchcock* 17542, 17554, 17562. Portage at head of Yarikita River, open shady ground. *Hitchcock* 17594. Macouria River, *Jenman* 2425*. Lama, *Jenman* 5972*. Barima River, *Jenman* 7074*. Tumatumari, *Gleason* 115.

37. LASIACIS (Griseb.) Hitchc.

Inflorescence of open (rarely compact) panicles terminating the culm and leafy branches; spikelets subglobose, placed obliquely on their pedicels; glumes and sterile lemma broad, papery, shining, glabrous, commonly lanate at the apex; fruit white, bony-indurate, obovoid, both lemma and palea bearing at the apex, in a slight crateriform excavation, a tuft of woolly hairs, the palea concave below, gibbous above, the apex often free at maturity; woody-stemmed clambering (rarely creeping) perennials.

Culms scarcely woody, erect; blades cordate-clasping; panicle as much as 1 meter long ..... 1. L. procerrima.

Culms woody, much branched; blades narrowed at base; panicles not more than 20 cm. long.

Ligule noticeable, brownish, about 2 mm. long; blades pubescent beneath. ..... 2. L. ligulata.

Ligule hidden within the mouth of the sheath; blades usually pubescent on both surfaces ..... 3. L. sorghoidea.

1. **Lasiacis procerrima** (Hack.) Hitchc. Proc. Biol. Soc. Washington **24**: 145. 1911.

Panicum procerrimum Hack. Oesterr. Bot. Zeitschr. **51**: 431. 1901.

Culms several in a clump, succulent, as much as 4 meters tall; blades cordate-clasping, as much as 40 cm. long and 5 cm. wide; panicle as much as 1 meter long, the branches naked below; spikelets scattered, 3 to 4 mm. long.

RANGE: Banks and open woods, Central Mexico to Guiana. Originally described from Costa Rica.

SPECIMEN FROM BRITISH GUIANA: Potaro River, Kaieteur Savanna, *Jenman* 813.

2. **Lasiacis ligulata** Hitchc. & Chase, Contr. U. S. Nat. Herb. **18**: 337. 1917.

Plants branched, woody, clambering to the height of 5 to 10 meters; ligule 1 to 2 mm. long; blades narrowly lanceolate, 6 to 12 cm. long, narrowed at base, puberulent beneath; panicles 5 to 10 cm. long, the spikelets obovoid, 4 mm. long, black and hard at maturity.

RANGE: Copses and open forest, Guatemala to Ecuador and Brazil. Originally described from Trinidad.

SPECIMENS FROM BRITISH GUIANA: Tumatumari, among bushes on hillside, *Hitchcock* 17345; *Gleason* 70. Issorora, *Hitchcock* 17553, 17567. Aruka River. *Bartlett* 8576. Pomeroon River, *Bartlett* in 1904. Orealla, Courantyne River, *Jenman* 257*. Pomeroon, *Jenman* 1916*. Bartica, *Jenman* 2053*. Berbice River, *Jenman* 3593*. Upper Demerara River, *Jenman* 4089. Also *Meyer*, a fragment from the Trinius Herbarium labeled "*Panicum glutinosum* Fl. Esseq."

This species was erroneously referred by Meyer [14] to *Panicum glutinosum* Lam.

3. **Lasiacis sorghoidea** (Desv.) Hitchc. & Chase, Contr. U. S. Nat. Herb. **18**: 338. 1917.

Panicum lanatum Swartz, Prodr. Veg. Ind. Occ. 24. 1788. Not *P. lanatum* Rottb. 1776.

Panicum sorghoideum Desv.; Hamilt. Prodr. Pl. Ind. Occ. 10. 1825.

Erect or clambering to a height of 5 to 7 meters, with a strong central cane as much as 1 cm. thick, the main branches 1 meter or more long, arcuate, bearing slender branchlets toward the pendent ends; sheaths and both surfaces of the blades velvety, or the sheaths glabrescent, the blades of the main branches commonly 20 cm. long and 2.5 cm. wide, those of the branchlets much smaller, often less velvety; panicles usually about 10 to 20 cm. long, at maturity as wide or wider, the spikelets more or less clustered on the long distant branches.

RANGE: Ravines, wood borders, and hedges, Mexico and the West Indies to Paraguay. Originally described from Porto Rico.

SPECIMEN FROM BRITISH GUIANA: Orealla, Courantyne River, *Jenman* 256.

38. SACCIOLEPIS Nash.

Inflorescence a narrow spikelike panicle; spikelets pointed, the second glume and sterile lemma inflated (the glume more or less saccate), much larger than the minutely stipitate fruit.

Spikelets 4 mm. long on slender pedicels ..... 1. *S. striata.*
Spikelets 2 mm. long, subsessile ..... 2. *S. myuros.*

1. **Sacciolepis striata** (L.) Nash, Bull. Torrey Club **30**: 383. 1903.

Holcus striatus L. Sp. Pl. 1048. 1753.

Panicum striatum Lam. Tabl. Encycl. **1**: 172. 1791.

Panicum gibbum Ell. Bot. S. C. & Ga. **1**: 116. 1816.

Hymenachne striata Griseb. Fl. Brit. W. Ind. 554. 1864.

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[14] Prim. Fl. Esseq. 62. 1818.

An aquatic or semiaquatic glabrous perennial, the culm 1 to 2 meters long, rooting at the geniculate lower nodes, bearing a few erect branches, with long flat blades and narrow panicles 10 to 20 cm. long.

RANGE: Swamps and ditches, southeastern United States to Guiana. Originally described from Virginia.

SPECIMENS FROM BRITISH GUIANA: Parika, old rice field, *Hitchcock* 16813. Baramanni Waini River, *Becket* 8453. Horeabea, *Jenman* 4450. Pomeroon River, *Stockdale* in 1909*.

2. **Sacciolepis myuros** (Lam.) Chase, Proc. Biol. Soc. Washington 21: 7. 1908.

Panicum myuros Lam. Tabl. Encycl. 1: 172. 1791.

Panicum myosurus L. Rich. Act. Soc. Hist. Nat. Paris 1: 106. 1792.

Hymenachne myuros Beauv. Ess. Agrost. 49, 165. 1812.

A slender glabrous annual as much as 1 meter tall, with elongate linear blades, the panicles compact, spikelike, about 5 mm. thick.

RANGE: Swamps and wet places, Mexico and Cuba to Brazil. Originally described from Cayenne.

SPECIMENS FROM BRITISH GUIANA: Parika, old rice field, *Hitchcock* 16814. Lama Stop-off, *Jenman* 4529. Lama Savanna, *Jenman* 5984*, 6029, 6030*.

39. HYMENACHNE Beauv.

Spikelets short-pedicellate in long, dense, spikelike or interrupted panicles; spikelets acuminate; lemma and palea scarcely indurate, the margins of the lemma flat, the palea not inclosed above.

Inflorescence dense, spikelike ..... 1. **H. amplexicaulis.**
Inflorescence long and narrow with ascending branches, not spikelike.
2. **H. auriculata.**

1. **Hymenachne amplexicaulis** (Rudge) Nees, Agrost. Bras. 276. 1829.

Panicum amplexicaule Rudge, Pl. Guian. 21. *pl.* 27. 1805.

A glabrous perennial with succulent, sparingly branching culms, broad linear cordate-clasping blades, the panicles about 8 mm. thick and 20 to 50 cm. long.

RANGE: Swamps and shallow water, often forming pure colonies. Tropics and subtropics of both hemispheres. Originally described from British Guiana.

SPECIMENS FROM BRITISH GUIANA: Vreed-en-Hoop, along ditch 3 miles west, *Hitchcock* 16740. Morawhanna, wet ground, *Hitchcock* 17512. Coast region, *Jenman* 4380, 4589. Horeabea, *Jenman* 4449. Lamaha, *Jenman* 6044. Pomeroon River, *Stockdale* in 1909*. Also *Meyer*, a fragment from the Trinius Herbarium labeled "Fl. Esseq."

2. **Hymenachne auriculata** (Willd.) Chase, Proc. Biol. Soc. Washington 21: 5. 1908.

Panicum auriculatum Willd. in Spreng. Syst. Veg. 1: 322. 1825.

Similar to *H. amplexicaulis*, olivaceous throughout (at least when dry), the panicles of numerous ascending, densely flowered branches, the lower distant.

RANGE: River banks and shallow water, Cuba to Brazil. Originally described from tropical America, no definite locality given.

SPECIMENS FROM BRITISH GUIANA: Parika, along ditch, *Hitchcock* 16810. Georgetown, in water of canal, *Hitchcock* 16972. Issorora, in water of ditch, *Hitchcock* 17587. Essequibo River, *Jenman* 1116.

40. HOMOLEPIS Chase.

Inflorescence paniculate; spikelets rather large, subfusiform; first and second glume equal or the first slightly the longer, 7 to 9-nerved, the pair wholly covering the sterile and fertile florets; sterile lemma nearly as long as the glumes,

broad, infolding the fertile lemma, and inclosing a narrow hyaline palea and sometime a staminate flower; fruit elliptic, pointed, smooth and shining, the lemma and palea less indurate than in *Panicum*, the margins of the lemma flat.

1. Homolepis isocalycia (Meyer) Chase, Proc. Biol. Soc. Washington **24**: 147. 1911.

Panicum isocalycium Meyer, Prim. Fl. Esseq. 59. 1818.

A slender branched straggling perennial clambering to the height of 2 to 3 meters, with oval panicles, 8 to 10 cm. long, pubescent in the lower axils; spikelets about 5 mm. long, the sterile lemma glabrous.

RANGE: Edge of forest in damp places, Guiana to Brazil. Originally described from British Guiana.

SPECIMENS FROM BRITISH GUIANA: Penal Settlement, edge of jungle along river, *Hitchcock* 17112. Mazaruni River, *Bartlett* 8059. Lamaha Dam, *Jenman* 6000 (*Panicum zizanioides* is mixed with this.)

41. ISACHNE R. Br.

Inflorescence paniculate; spikelets small, subglobose; glumes subequal; lower floret perfect or staminate, its lemma and palea indurate and similar in form and texture to those of the upper floret; both fruits plano-convex, nearly equal in size, usually remaining attached by the minute rachilla joint between them.

1. Isachne polygonoides (Lam.) Doell in Mart. Fl. Bras. **2**^{2}: 273. 1877.

Panicum polygonoides Lam. Encycl. **4**: 742. 1798.

Isachne trachysperma Nees in Seem. Bot. Herald 224. 1857.

Flowering shoots 20 to 30 cm. tall, erect from a long, creeping, freely branching culm, rooting at the nodes, the whole plant often a meter in length, the erect shoots finally bearing fascicled branchlets, the sheaths hispid, the spreading lanceolate-ovate blades very scabrous; panicles included at base, about 5 cm. long and as broad, loosely many-flowered.

RANGE: Moist ground, Central America to Brazil. Originally described from Cayenne.

SPECIMEN FROM BRITISH GUIANA: Bartica, along the wet shore, *Jenman* 5975.

42. OPLISMENUS Beauv.

Inflorescence of several thick racemes along a common axis; spikelets subsessile; glumes and sterile lemma awned or mucronate; fruit as in *Panicum*, acute.

1. Oplismenus hirtellus (L.) Beauv. Ess. Agrost. 54, 168. 1812.

Panicum hirtellum L. Syst. Nat. ed. 10. **2**: 870. 1759.

A slender, creeping, branching perennial, the ascending or erect flower culms 30 to 50 cm. tall, the lanceolate blades undulate-margined; racemes ascending or spreading, as much as 3 cm. long, usually 1 to 2 cm.

RANGE: Moist woods and shady banks, throughout tropical America. Originally described from Jamaica.

SPECIMEN FROM BRITISH GUIANA: Georgetown, Promenade Gardens, *Hitchcock* 16597.

Oplismenus burmanni (Retz.) Beauv., with pilose sheaths and villous racemes, is represented in the Jenman Herbarium by two specimens, one having a printed label, "Garden plants. Cultivated in the British Guiana Botanic Gardens." with no data but the number (4201) and year (1888). The other has a printed Jenman label but no data except the year (1888).

43. ECHINOCHLOA Beauv.

Inflorescence paniculate, the usually compact, densely flowered panicle composed of 1-sided racemes or of subsimple branches; spikelets hispid or spiny; glumes usually mucronate; sterile lemma usually awned; fruit subindurate, acuminate-pointed, the summit of the palea not inclosed.

Spikelets awnless or mucronate only; racemes simple, rather remote.
1. E. colonum.

Spikelets more or less awned; racemes subcompound, approximate.

Ligule obsolete; spikelets, excluding awns, 3 to 4 mm. long.
2. E. crusgalli crus-pavonis.

Ligule of stiff yellow hairs; spikelets, excluding awns, 5 to 6 mm. long.
3. E. polystachya.

1. **Echinochloa colonum** (L.) Link, Hort. Berol. 2: 209. 1833.

Panicum colonum L. Syst. Nat. ed. 10. 2: 870. 1759.

A glabrous tufted annual, the culms compressed, branching at the more or less decumbent base; blades flat, linear, about 5 mm. wide, sometimes barred with purplish brown; racemes usually 5 to 10, ascending, distant nearly their own length on the strict axis.

RANGE: Ditches and moist places in the warmer parts of both hemispheres; introduced in America. Originally described from America.

SPECIMENS FROM BRITISH GUIANA: Georgetown, a weed along ditches, *Hitchcock* 16604. Coast lands, *Jenman* 4515, 6023*, 6031*.

2. **Echinochloa crusgalli crus-pavonis** (H. B. K.) Hitchc. Contr. U. S. Nat. Herb. 22: 148. 1920.

Oplismenus crus-pavonis H. B. K. Nov. Gen. & Sp. 1: 108. 1816.

Panicum sabulicola Nees, Agrost. Bras. 258. 1829.

An erect, often robust, usually fleshy annual, with nearly simple culms often decumbent and rooting at base, and long narrow nodding panicles of usually long-awned spikelets; sheaths sometimes hirsute or papillose.

RANGE: Swamps and ditches, throughout tropical America. Originally described from Venezuela.

SPECIMENS FROM BRITISH GUIANA: Without locality, *Jenman* 5991; *Schomburgk* 151 (a long-awned form). Georgetown, *Rodway* 43.

3. **Echinochloa polystachya** (H. B. K.) Hitchc. Contr. U. S. Nat. Herb. 22: 135. 1920.

Oplismenus polystachyus H. B. K. Nov. Gen. & Sp. 1: 107. 1816.

Panicum spectabile Nees in Trin. Gram. Pan. 138. 1826.

A robust fleshy perennial, the tall culms erect from a creeping base, the nodes usually villous, the blades as much as 3 cm. wide, the narrow, densely flowered panicle erect or nearly so.

RANGE: Swamps near the coast, southern Mexico and the West Indies to Paraguay. Originally described from Colombia.

SPECIMENS FROM BRITISH GUIANA: West of Vreed-en-Hoop, in water of canal, *Hitchcock* 16695, 16791. Pomeroon River, *Jenman* 1619*. New Amsterdam, *Jenman* 4603. Canje River, *Jenman* 5973*. Marlborough, *Jenman* 7795. Hyde Park, Demerara River, *Jenman* in 1889*.

44. CHAETOCHLOA Scribn.

(*Setaria* Beauv.)

Inflorescence a dense spikelike (rarely loose) panicle, the spikelets solitary or in small clusters subtended by 1 to several slender scabrous bristles (sterile

branchlets), these persistent after the fall of the spikelets; spikelets as in *Panicum*, turgid, the fruit usually transversely rugose.

Bristles antrorsely scabrous, 5 to 12 at the base of each spikelet; inflorescence a dense cylindric spikelike panicle----------1. **C. geniculata.**

Bristles retrorsely scabrous, 1 to 3 below each spikelet; inflorescence somewhat loose or interrupted----------2. **C. tenax.**

1. **Chaetochloa geniculata** (Lam.) Millsp. & Chase, Field Mus. Bot. 3: 37. 1903.

Panicum geniculatum Lam. Encycl. 4: 727 (err. typ. 737). 1798.

Setaria purpurascens H. B. K. Nov. Gen. & Sp. 1: 110. 1816.

Panicum imberbe Poir. in Lam. Encycl. Suppl. 4: 272. 1816.

Tufted, the slender compressed culms erect, geniculate at base, or sometimes spreading, the blades mostly 5 to 8 mm. wide, the long-exserted, dense, spikelike, yellow, or purplish panicle 5 to 10 cm. long, 6 to 8 mm. thick, excluding the bristles.

The bristles vary in length and color. Early in the season they are longer than the spikelets, but on later spikes they may be shorter than the spikelets.

RANGE: Open ground, waste places, and grassland, throughout the American tropics and northward into southern and eastern United States. Originally described from Guadeloupe.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, along canal, *Hitchcock* 16554; grassy border of ditch, *Hitchcock* 16839. Coast region, *Jenman* 4377. Lamaha Dam, *Jenman* 6012*. Kwaimatta, *Jenman* 6781*. Without locality, *Jenman* 6465*, *Schomburgk* 552.

2. **Chaetochloa tenax** (L. Rich.) Hitchc. Contr. U. S. Nat. Herb. 22: 176. 1920.

Panicum tenax L. Rich. Act. Soc. Hist. Nat. Paris 1: 106. 1792.

Panicum impressum Nees, Agrost. Bras. 247. 1829.

Setaria biconvexa Griseb. Fl. Brit. W. Ind. 555. 1864.

Tufted, erect, commonly 1 meter tall, the culms and sheaths compressed, the numerous elongate blades mostly 0.8 to 1.2 cm. wide, usually reaching beyond the base of the rather loose panicle of large globose spikelets and long flexuous retrorsely-scabrous bristles.

RANGE: Savannas, rocky banks, and open woods, southern Mexico and the West Indies to Brazil. Originally described from Cayenne.

This was described by Grisebach [15] as *Setaria onurus*, but that name is based on a different species from Uruguay.

SPECIMENS FROM BRITISH GUIANA: Canje River, *Jenman* 1905*, 1906*. Without locality, *Schomburgk* 414.

45. PENNISETUM Pers.

Spikelets 1 to 3 together, subtended by a whorl of slender bristles (sterile branchlets), subsessile along a common axis forming bristly spikes, the bristles falling attached to the lanceolate spikelets.

1. **Pennisetum setosum** (Swartz) L. Rich. in Pers. Syn. Pl. 1: 72. 1805.

A tall leafy branching perennial, erect or ascending from a geniculate base, the long flat blades pubescent or scabrous, the purplish spikes 10 to 15 cm. long, the long slender bristles at maturity spreading horizontally or slightly reflexed.

RANGE: Grassy slopes and open woods, Florida to Brazil. Originally described from the West Indies.

SPECIMENS FROM BRITISH GUIANA: Holmia, Potaro River, *Bartlett* in 1907. Kwaimatta, *Jenman* 6797*.

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[15] Fl. Brit. W. Ind. 555. 1864.

46. CENCHRUS L.

Spikelets 1 to 4 together, subtended and surrounded by a spiny bur formed of adnate sterile branches, the burs subsessile along a common axis, falling with the spikelets and permanently inclosing them; spikelets acuminate, the first glume sometimes obsolete.

Plants annual; burs, excluding bristles, 5 to 7 mm. wide, not densely crowded; involucral lobes erect ..... 1. C. echinatus.

Plants perennial in large tufts; burs, excluding bristles, not over 4 mm. wide, numerous, crowded in a long spike; involucral lobes interlocking. 2. C. dactylolepis.

1. **Cenchrus echinatus** L. Sp. Pl. 1050. 1753. SANDBUR.

Culms usually about 50 cm. long, ascending from a decumbent base, branching below; blades flat, thin, usually elongate, 5 to 10 mm. wide; spike commonly 5 to 7 cm. long.

RANGE: Open ground and waste places; a common weed throughout the warmer parts of America. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Georgetown, along streets, *Hitchcock* 16741. Lamaha banks, *Jenman* 3645. Coast region, *Jenman* 4369, 4513*, 5964*. Also *Meyer*, a fragment from a specimen in the Trinius Herbarium, labeled "Meyer, Fl. Esseq."

2. **Cenchrus dactylolepis** Steud. Syn. Pl. Glum. 1: 109. 1854.

A perennial, growing in large clumps, the culms rather stout, 30 to 60 cm. tall, the shoots strongly compressed; spike 4 to 8 cm. long, 1 cm. thick.

The burs closely resemble those of *C. viridis* but the plant differs in being perennial and in the large compressed overlapping sheaths.

RANGE: Open grassland, British and Dutch Guiana. Originally described from the latter country.

SPECIMENS FROM BRITISH GUIANA: New Amsterdam, grassland along road, *Hitchcock* 16820. Upper Demerara River, *Jenman* 4011.

47. OLYRA L.

Plants monoecious; inflorescence paniculate; pistillate spikelets borne on the upper branches and on the ends of the lower branches of loose terminal panicles, the smaller staminate spikelets pedicellate along the lower branches; pistillate spikelets rather large; first glume wanting; second glume and sterile lemma herbaceous, caudate-acuminate; fruit bony-indurate; staminate spikelets readily deciduous; glumes and sterile lemma wanting, the lemma and palea membranaceous.

Fruit pubescent; panicles narrow ..... 1. O. surinamensis.

Fruit glabrous; panicles large and somewhat spreading.

Fruit pitted, about 3 mm. long ..... 2. O. micrantha.

Fruit smooth, more than 3 mm. long.

Blades ovate-cordate, the uppermost as much as 7 cm. wide. 3. O. cordifolia.

Blades oblong, rounded or narrowed at base, not distinctly cordate.

Pistillate spikelets, including the long point, 3 to 4 cm. long, single at the ends of ascending branches, as much as 10 to 12 cm. long. 4. O. caudata.

Pistillate spikelets mostly less than 2 cm. long, the branches of the panicle usually not over 5 cm. long ..... 5. O. latifolia.

1. **Olyra surinamensis** Hochst.; Steud. Syn. Pl. Glum. 1: 36. 1854.

Differs from *O. latifolia* in the numerous narrow few-flowered appressed axillary panicles, the narrow pistillate spikelets, and the pubescent fruit.

RANGE: Wet forest and swamps. British and Dutch Guiana. Originally described from the latter country.

SPECIMENS FROM BRITISH GUIANA: Near Lama Stop-off, edge of wet forest, *Hitchcock* 16979. Penal Settlement, edge of forest by river, *Hitchcock* 17241. Rockstone, wet forest, *Hitchcock* 17332. Tumatumari, wet forest, *Hitchcock* 17363. Akyma, wet forest, *Hitchcock* 17423. Issorora, wet forest, *Hitchcock* 17577. Lama Creek, *Jenman* 5963. Demerara River, *Jenman* 6737. Berbice, *Jenman* 6813*. Barima River, *Jenman* 6992*. Potaro River, *Jenman* 7528. Banks of Yawakuri River, County Berbice (Cattle-trail Survey), *Abraham* 189.

2. Olyra micrantha H. B. K. Nov. Gen. & Sp. 1: 199. 1816.

Growing to the height of 3 to 5 meters, the blades as much as 30 cm. long and 10 cm. wide, rounded but scarcely cordate at base, the panicles as much as 30 cm. long; fruits pitted, 3 mm. long.

The pistillate spikelets are much smaller than in any of the other species of the region.

RANGE: Rich woods, Guiana to Paraguay. Originally described from Brazil.

SPECIMENS FROM BRITISH GUIANA: Rockstone, wet forest, *Hitchcock* 17283; *Jenman* 7548; *Gleason* 624. Essequibo River, *Jenman* 2384*. Upper Demerara River, *Jenman* 4119. Demerara River, *Jenman* 6674*. Mt. Roraima, 1,050 meters, *McConnell & Quelch* 708.

3. Olyra cordifolia H. B. K. Nov. Gen. & Sp. 1: 198. 1816.

Resembling *O. latifolia*, but differing in the ovate-oblong blades with a cordate base.

RANGE: Forests, Guiana and Colombia to Paraguay. Originally described from Colombia.

SPECIMEN FROM BRITISH GUIANA: Without locality, *Schomburgk* 672.

4. Olyra caudata Trin. Linnaea 10: 292. 1836.

Differs from *O. latifolia* in having the main panicle branches as much as 10 or 12 cm. long, with a single pistillate spikelet at the summit and numerous staminate spikelets below, the point of the pistillate spikelet 2 to 3 cm. long.

RANGE: Forests, Guiana to Peru. Originally described from the latter country.

SPECIMEN FROM BRITISH GUIANA: Cabalebo, Courantyne River, *Jenman* 134.

5. Olyra latifolia L. Syst. Nat. ed. 10. 2: 1261. 1759.

Olyra paniculata Swartz, Prodr. Veg. Ind. Occ. 21. 1788.

Olyra arundinacea H. B. K. Nov. Gen. & Sp. 1: 197. 1816.

Glabrous perennial, bamboo-like in aspect, commonly 5 meters tall, the strong hollow culms sometimes 1 cm. thick, erect and unsupported, the summit only arching (or weaker culms leaning among brush), the lower half to two-thirds simple and naked, the short sheaths bladeless or nearly so, the elongate internodes blotched with dull purple, branching from the upper nodes, the branches commonly fascicled, divaricate, often 1 meter long, sometimes again branching; blades convolute in the bud, spreading, flat, firm, asymmetrically lanceolate-oblong, abruptly acuminate, commonly 20 cm. long and 5 cm. wide, those of the ultimate branches smaller, the lowermost on both primary culm and branches rudimentary; panicles 10 to 15 cm. long, about two-thirds as wide, those of the secondary branches reduced, the branches stiffly ascending or spreading, each bearing a single large long-acuminate pistillate spikelet at the thickened summit and several small slender-pediceled staminate spikelets along the rachis.

RANGE: Copses and edge of forests, throughout tropical America. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: Near Bartica, edge of forest, *Hitchcock* 17253. Akyma, shady hillside, *Hitchcock* 17416. Short Cut Waini River, *Becket* in 1906. Epira, Courantyne River, *Jenman* 92*. Lama, *Jenman* 5981. Berbice, *Jenman* 6501*.

48. RADDIA Bertol.

Plants monoecious; staminate and pistillate spikelets in distinct small panicles, the staminate terminal or from the upper nodes, the pistillate axillary; first glume of the pistillate spikelets wanting, the second glume and sterile lemma membranaceous, acuminate; fruit dorsally subcompressed, bony-indurate.

Blades glabrous, firm, triangular-oblong, tapering from a truncate base to the rounded summit, 5 to 7 mm. wide at base----------1. **R. nana.**

Blades pubescent, thin, elliptic or elliptic-oblong, mostly 3 to 4 mm. wide.
2. R. malmeana.

1. **Raddia nana** (Doell) Chase, Proc. Biol. Soc. Washington **21**: 185. 1908.
Olyra nana Doell in Mart. Fl. Bras. **2**²: 329. 1877.

A tufted straggling perennial with delicate, nearly simple culms, 10 to 30 cm. long, naked below, the small, flat, oblong-triangular, spreading or deflexed blades 10 to 12 mm. long, 5 to 7 mm. wide, the apex rounded, abruptly mucronate, approximate along the upper part of the culm, the small few-flowered axillary racemes scarcely exserted from the upper sheaths.

RANGE: Wet sandy savannas, Trinidad to Brazil, whence originally described.

SPECIMEN FROM BRITISH GUIANA: Lama Dam, near Matawini Creek, *Jenman* 5971.

2. **Raddia malmeana** (Ekman) Hitchc.
Olyra malmeana Ekman, Ark. för Bot. **10**: 21, *pl. 2. f. 3; pl. 6. f. 9.* 1911.

A delicate tufted perennial, the slender culms 5 to 10 cm. tall; sheaths mostly shorter than the internodes, pilose at the summit; blades thin, pubescent, elliptic or elliptic-oblong, 10 to 13 mm. long, 3 to 4 mm. wide; pistillate spikelet pubescent, about 1.5 mm. long.

RANGE: Savannas, Guiana to Brazil. Originally described from Matto Grosso, Brazil.

SPECIMEN FROM BRITISH GUIANA: Kaieteur Savanna, Potaro River, *Jenman* 1277.

49. IMPERATA Cyrillo.

Spikelets all perfect, awnless, all pedicellate, articulate below the glumes, the rachis not disjointing, the slender racemes in a narrow spikelike panicle; glumes membranaceous, densely clothed with long silky hairs.

Panicle rarely over 10 cm. long; spikelets 4 mm. long--------1. **I. brasiliensis.**
Panicle and blades elongate; spikelets 3 mm. long----------2. **I. contracta.**

1. **Imperata brasiliensis** Trin. Mém. Acad. St. Pétersb. VI. Math. Phys. Nat. **2**: 331. 1832.

An erect tufted perennial with scaly rhizomes, the flat leaves mostly clustered toward the base, the slender, simple, nearly naked culm 0.5 to 1 meter tall, with a pale silky narrow panicle.

RANGE: Open rather dry ground at low altitudes, Bahamas and southern Mexico to Brazil. Originally described from Brazil.

SPECIMENS FROM BRITISH GUIANA: Parika, along railroad, *Hitchcock* 16815. Lamaha, No. 1 Benab, *Jenman* 4567. Without locality, *Schomburgk* 665.

2. **Imperata contracta** (H. B. K.) Hitchc. Rep. Mo. Bot. Gard. 4: 146. 1893.
Saccharum contractum H. B. K. Nov. Gen. & Sp. 1: 182. 1816.
Imperata caudata Trim. Mém. Acad. St. Pétersb. *VI.* Math. Phys. Nat. 2: 331. 1832.

Taller than the preceding, the culms leafy, the panicle as much as 40 cm. long.

RANGE: Swamps and moist open ground, southern Mexico and the West Indies to northern South America. Originally described from Colombia.

SPECIMENS FROM BRITISH GUIANA: Akyma, grassland in wet clearing, *Hitchcock* 17429. Morawhanna, a weed in field, *Hitchcock* 17506. Canje River, *Jenman* 1903. Coast region, *Jenman* 4576. Lamaha Savanna, *Jenman* 6034.

Sugarcane (*Saccharum officinarum* L. Sp. Pl. 54. 1753) is commonly cultivated and may occur spontaneously, though all the specimens in our collections are from cultivated plants. This is a gigantic perennial with broad leaves, the overlapping sheaths falling from the short-jointed lower part of the culms, the great plumy panicles pinkish silvery. Seed is produced sparingly.

Cultivated in tropical and subtropical countries of both hemispheres. Originally described from India.

50. ANDROPOGON L.

Sessile spikelet perfect, usually awned; pedicellate spikelet staminate or neuter; rachis articulate; racemes solitary, digitate, or approximate along a continuous main axis.

Spikelets awned.
First glume with a pit like a pin hole in the back.
1. **A. pertusus panormitanus.**
First glume without a pit.
Culm villous below the inflorescence——2. **A. nodosus.**
Culm glabrous below the inflorescence.
Glumes of sessile spikelets papillose-hispid, obscurely nerved, obtusely rounded, closely overlapping——3. **A. annulatus.**
Glumes of sessile spikelets softly villous, strongly nerved, acute, loosely overlapping——4. **A. ischaemum.**
Spikelets awnless.
Spikelets glabrous——5. **A. virgatus.**
Spikelets woolly.
Inflorescence large, club-shaped, the numerous ascending or appressed branches forming a compound panicle; plant 1 meter or more tall.
6. **A. bicornis.**
Inflorescence of several long-peduncled pairs of racemes; plants slender, 30 to 60 cm. long.
Sessile spikelets about 3 mm. long; blades usually not over 2 mm. wide, the apex acute——7. **A. leucostachyus.**
Sessile spikelets about 4 mm. long; blades 3 to 5 mm. wide, the apex boat-shaped——8. **A. selloanus.**

1. **Andropogon pertusus panormitanus** (Parl.) Hack. in DC. Monogr. Phan. 6: 481. 1889. BARBADOS SOURGRASS.
Andropogon panormitanus Parl. "in Diar. Congr. Venezia 1847"; Fl. Ital. 1: 140. 1848.

An ascending branching tufted perennial with glabrous nodes and nearly glabrous blades and somewhat fan-shaped panicles of several villous racemes with twisted bent awns about 1 cm. long.

RANGE: Roadsides and open grassy places, warmer parts of the Old World. Originally described from Sicily.

SPECIMEN FROM BRITISH GUIANA: From Barbados, "a valuable grass." 7686, a cultivated specimen, the collector not given.

2. **Andropogon nodosus** (Willem.) Nash, N. Amer. Fl. 17: 122. 1912.

Dichanthium nodosum Willem. Ann. Bot. Usteri 18: 11. 1796.

A decumbent, freely branched, low perennial with flat blades, 2 to 8 cm. long, and solitary or paired racemes, the sterile spikelets as conspicuous as the fertile ones, giving the appearance of a flat 2-ranked scaly spike; awns slender, twisted, and bent.

RANGE: Waste places; introduced in a few places in the West Indies from the tropics of the Old World. Originally described from Mauritius.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Botanic Gardens, grassland, *Hitchcock* 16614; *Kartright* in 1912.

3. **Andropogon annulatus** Forsk. Fl. Aegyp. Arab. 173. 1775.

Resembling *A. pertusus panormitanus*, but differing in the absence of the pit on the back of the glumes and in the more imbricate spikelets; nodes bearded.

RANGE: A native of the Old World, originally described from Egypt.

SPECIMEN FROM BRITISH GUIANA: Georgetown, Botanic Gardens, grassland, *Hitchcock* 16551.

4. **Andropogon ischaemum** L. Sp. Pl. 1047. 1753.

Resembling *A. annulatus*, but the racemes more slender and rather more numerous.

RANGE: A native of the Old World. Originally described from Europe.

SPECIMEN FROM BRITISH GUIANA: Georgetown, Botanic Gardens, grassland, *Hitchcock* 16549.

5. **Andropogon virgatus** Desv.; Hamilt. Prodr. Pl. Ind. Occ. 9. 1825.

Andropogon spathiflorus Kunth, Enum. Pl. 1: 496. 1833.

Anatherum spathiflorum Griseb. Cat. Pl. Cub. 236. 1866.

A tall glabrous tufted perennial with compressed rigid culms, long linear blades, and elongate panicles of small glabrous racemes partly inclosed in rufous or purplish spathes.

RANGE: Wet sandy open swamps or savannas, West Indies and Central America to Brazil. Originally described from the "Antilles."

SPECIMENS FROM BRITISH GUIANA: Southeast of Lama Stop-off, dike along canal, *Hitchcock* 16965. Lama Savanna, *Jenman* 5988. Without locality, *Schomburgk* 666.

6. **Andropogon bicornis** L. Sp. Pl. 1046. 1753.

A tall robust tufted perennial, with long linear blades scabrous on the margin, and a large feathery corymbose inflorescence of delicate racemes, one, sometimes two, of the uppermost pediceled spikelets larger than the fertile ones, the other pediceled spikelets rudimentary.

RANGE: Savannas and open ground, southern Mexico and the West Indies to Brazil. Originally described from Jamaica.

SPECIMENS FROM BRITISH GUIANA: West of Vreed-en-Hoop, low ground, *Hitchcock* 16724. Parika, moist meadow, *Hitchcock* 16760. Kyk-over-al Island, open ground, *Hitchcock* 17201. Akyma, wet clearing, *Hitchcock* 17430. Morawhanna, in wet field, *Hitchcock* 17505. Canje River, *Jenman* 1898*. Bartica, *Jenman* 2459*. Lama Savanna, *Jenman* 5989, 5990. Rupununi Savanna, *Melville*. Without locality, *Schomburgk* 761. Also *Meyer*, a fragment from a specimen in the Trinius Herbarium labeled "Fl. Esseq." Potaro Landing, *Gleason* 257.

7. **Andropogon leucostachyus** H. B. K. Nov. Gen. & Sp. 1: 187. 1816.

A slender, densely tufted, erect perennial, the elongate blades with a deeply impressed midvein; racemes 2 or 3 on slender exserted peduncles, the spikelets obscured by the copious long silky hairs.

RANGE: Cliffs and grassy slopes, southern Mexico and the West Indies to Brazil. Originally described from Venezuela.

SPECIMENS FROM BRITISH GUIANA: Penal Settlement, rocky hill, *Hitchcock* 17161. Wismar, sand hills, *Hitchcock* 17274. Mackenzie, grassland in clearing, *Hitchcock* 17464. Upper Demerara River, *Jenman* 4062.

8. **Andropogon selloanus** (Hack.) Hack. Bull. Herb. Boiss. II. 4: 266. 1904.

Andropogon leucostachyus var. *selloanus* Hack. in DC. Monogr. Phan. 6: 420. 1889.

Similar to the preceding, stouter, the blades shorter, broader, and with a boat-shaped tip; racemes often 5 or 6.

RANGE: Savannas and open ground, West Indies to Paraguay. Originally described from Brazil.

SPECIMEN FROM BRITISH GUIANA: Kwaimatta, *Jenman* 6183.

51. CYMBOPOGON Spreng.

Racemes 2, on slender peduncles, subtended by a spathelike sheath, a staminate awnless spikelet borne at the summit of the peduncle in the fork of the two racemes, one or both of the racemes sometimes again forking at the lower joints with a staminate spikelet in the fork, one of the secondary racemes reduced to a single joint.

1. **Cymbopogon bracteatus** (Humb. & Bonpl.) Hitchc. Contr. U. S. Nat. Herb. 17: 209. 1913.

Andropogon bracteatus Humb. & Bonpl.; Willd. Sp. Pl. 4: 914. 1806.

An erect perennial a meter or more tall, the sheaths more or less hispid, especially near the summit, the blades long and narrow, appressed-hispid beneath; panicle narrow, 10 to 20 cm. long, terminal and axillary, the upper branches of the main culm appressed, the panicles combining with that of the main culm to form a compound inflorescence; bracts of spathes of the pairs of racemes short and narrow, 1 to 2 cm. long, appressed-hispid; peduncles of the pair of racemes and the axil of the pair villous; racemes mostly less than 1 cm. long, few-flowered, the awns about 2 cm. long.

RANGE: Savannas, southern Mexico to Brazil. Originally described from Venezuela.

SPECIMEN FROM BRITISH GUIANA: Rupununi Savanna, *Melville*.

52. ANATHERUM Beauv.

Racemes long, slender, on long filiform peduncles borne in whorls on an elongate axis, forming a large panicle; spikelets awnless, arranged as in *Andropogon*, the filiform rachis tardily disjointing.

1. **Anatherum zizanioides** (L.) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 285. 1917. KHUSKHUS.

Phalaris zizanioides L. Mant. Pl. 2: 183. 1771.

Andropogon muricatus Retz. Obs. Bot. 3: 43 [31]. 1783.

Vetiveria arundinacea Griseb. Fl. Brit. W. Ind. 559. 1864.

A robust, densely tufted, erect, branching perennial with scabrous-margined blades, elongate-pyramidal panicles, and muricate spikelets.

RANGE: Commonly cultivated in the American tropics as a hedge plant and for its aromatic roots, which are used for mats and screens. Sometimes escaped along roadsides. Originally described from India.

SPECIMEN FROM BRITISH GUIANA: Parika, along ditch, *Hitchcock* 16809.

53. HOLCUS L.

Racemes reduced to 1 to 5 joints, borne on slender peduncles on the slender branches of a compound panicle; rachis slender, tardily disjointing; spikelets arranged as in *Andropogon*, the pedicellate spikelet usually staminate, the sessile spikelets awnless or with a deciduous awn.

1. **Holcus sorghum** L. Sp. Pl. 1047. 1753. SORGHUM or SORGO.

A large broad-leaved annual, with a compact panicle of turgid persistent spikelets.

RANGE: Occasionally cultivated and sometimes spontaneous in waste places or near fields. Widely cultivated in the warmer parts of America and in the Old World, whence originally described.

SPECIMEN FROM BRITISH GUIANA: Demerara River, naturalized at settlement, *Jenman* 3961.

Sometimes called Guinea corn.

1a. **Holcus sorghum sudanensis** (Piper) Hitchc. Proc. Biol. Soc. Washington **29**: 128. 1916. SUDAN GRASS.

Andropogon sorghum sudanensis Piper, Proc. Biol. Soc. Washington **28**: 33. 1915.

More slender than the typical form, with an open panicle, the blades often only 1 cm. wide.

RANGE: Coming into cultivation in the West Indies and British Guiana in recent years and sparingly escaped. Described from a cultivated specimen grown from seed from the Sudan.

SPECIMEN FROM BRITISH GUIANA: New Amsterdam, waste places, well established, *Hitchcock* 16818.

54. ERIOCHRYSIS Beauv.

Spikelets awnless, the sessile spikelets perfect, the pedicellate spikelets pistillate, smaller but fruitful, readily falling, the rachis rather tardily disjointing; racemes short, crowded in a narrow dense silky interrupted spikelike panicle.

1. **Eriochrysis cayennensis** Beauv. Ess. Agrost. 8. *pl. 4. f. 11.* 1812. (Beauvois spells the name "*Cayancnsis*.")

An erect unbranched perennial 1 to 2 meters or more tall, the long narrow blades densely velvety, the compact silky golden-brown panicle 10 to 12 cm. long.

RANGE: Moist slopes and savannas, southern Mexico and the West Indies to Uruguay. The type locality is presumably Cayenne, though no locality is mentioned in the original description.

SPECIMENS FROM BRITISH GUIANA: Mt. Roraima, "our house," *Im Thurn* 246. Without locality, *Schomburgk* 654. "Within 30 miles of Georgetown," *Rodway* 81, the specimen in the City Museum of Georgetown.

55. HETEROPOGON Pers.

Racemes solitary, the lower part of the rachis not disjointing, bearing 2 to 5 pairs of staminate awnless spikelets, the upper part of the rachis disarticu-

lating obliquely at the base of each joint, each forming a sharp callus below the long-awned sessile perfect spikelet, the pedicellate spikelet staminate.

1. Heteropogon contortus (L.) Beauv.; Roem. & Schult. Syst. Veg. 2: 836. 1817.

Andropogon contortus L. Sp. Pl. 1045. 1753.

Andropogon secundus Willd.; Nees, Agrost. Bras. 364. 1829.

A tall branching annual with compressed culms, keeled sheaths, scabrous blades, and solitary racemes of imbricate spikelets, the lower awnless, the upper with long brown bent awns.

Lemon-scented when fresh.

RANGE: Rocky slopes, warmer parts of both hemispheres. Originally described from India.

SPECIMEN FROM BRITISH GUIANA: Without locality, *Schomburgk* 762.

56. TRACHYPOGON Nees.

Perfect spikelet awned, pedicellate, the pedicel disjointing obliquely, forming a sharp callus below the spikelet; staminate spikelet subsessile, persistent on the slender continuous rachis; racemes solitary or few to several, digitate.

1. Trachypogon plumosus (Humb. & Bonpl.) Nees, Agrost. Bras. 344. 1829.

Andropogon plumosus Humb. & Bonpl.; Willd. Sp. Pl. 4: 918. 1806.

Trachypogon polymorphus var. *plumosus* Hack. in Mart. Fl. Bras. 2^3: 265. 1883.

A tall, glabrous, sparingly branched perennial, with flat blades and commonly 2 or 3 racemes.

RANGE: Savannas, Central America to Brazil. Originally described from Cumaná, Venezuela.

SPECIMENS FROM BRITISH GUIANA: Wiruni-Ituni Savanna, County Berbice (Cattle-trail Survey), *Abraham* 12. Yawakuri Savanna, County Berbice (Cattle-trail Survey), *Abraham* 176. Kwaimatta, *Jenman* 6182*. Without locality, *Schomburgk* 673.

57. ELYONURUS Humb. & Bonpl.

Spikelets alike, in pairs, one sessile and perfect, the other pedicellate and staminate, both awnless, arranged in a spikelike raceme.

1. Elyonurus adustus (Trin.) Ekman, Ark. för Bot. 13^{10}: 6. 1913.

Andropogon adustus Trin. Mém. Acad. St. Pétersb. VI. Math. Phys. Nat. 2: 259. 1832.

Andropogon latiflorus Nees; Steud. Syn. Pl. Glum. 1: 364. 1854.

Elyonurus latiflorus Nees; Hack. in Mart. Fl. Bras. 2^3: 307. 1883.

An erect cespitose perennial, about 1 meter tall, with narrow flat blades 2 to 3 mm. wide and solitary woolly racemes 4 to 6 cm. long.

RANGE: Savannas, Guiana to Brazil, whence originally described.

SPECIMENS FROM BRITISH GUIANA: Wiruni-Ituni Savannas, County Berbice (Cattle-trail Survey), *Abraham* 9. Orealla, *Jenman* 48*.

58. MANISURIS L.

Sessile spikelets perfect, awnless, sunken in hollows in the thickened articulate joints of the rachis, the flat, often rugose, indurate first glume covering the hollow; pedicellate spikelet sterile, the pedicel thickened, appressed or adnate to the rachis joint; racemes solitary.

1. Manisuris guianensis Hitchc., sp. nov. FIG. 86.

An erect perennial about 1 meter tall; culms terete, glabrous, rather stiff and wandlike; sheaths glabrous, striate, mostly longer than the internodes, wider

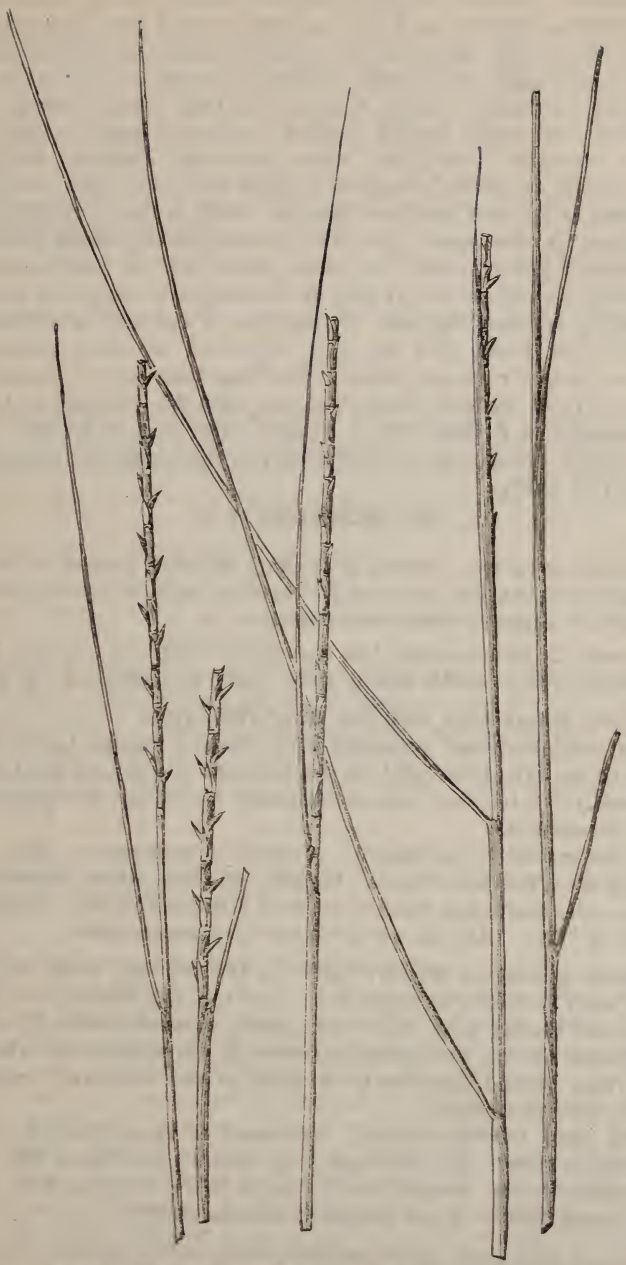

FIG. 86.—*Manisuris guianensis*. From the type specimen.

than the base of the blade, producing on each side a firm shoulder; ligule a short membrane about 0.5 mm. long, minutely ciliate; blades spreading, flat or loosely convolute, glabrous, 15 to 25 cm. long, about 4 mm. wide, narrowed toward the base, strongly nerved on both surfaces; raceme stiffly erect, cylindric, the diameter about that of the culm or slightly greater, as much as 20 cm. long, glabrous, the internodes mostly 5 to 8 mm. long, terete, striate, with the sessile spikelet and sterile pedicel forming a cylinder; sessile spikelet about as long as the internode; first glume oblong-lanceolate, obscurely 3-ridged longitudinally, slightly roughened along the margins with 4 to 8 small lumps; second glume as long as the first, thin and hyaline; sterile lemma a little shorter than the first glume, its palea about two-thirds as long; fertile lemma a little shorter than the second glume, acute, the palea about half as long, obtuse; sterile pedicel falcate, several-nerved, as long as the internode, narrowed at base, leaving an opening between that and the margins of the axis, a similar opening between the first glume and the axis, narrowed at apex; sterile spikelet reduced to a circular rudiment about 1 mm. long, made up of 2 glumes.

Type in the U. S. National Herbarium, no. 1,039,395, collected at Lama Stop-off, near Georgetown, British Guiana, October, 1888, by G. S. Jenman (no. 4530).

The only other specimen seen was collected on the Lama Savanna, April, 1888, by Jenman (no. 6032).

59. ISCHAEMUM L.

Sessile spikelets perfect, awned; pedicellate spikelets perfect but not always fruitful; rachis disjointing; racemes 2 to several, digitate, usually so appressed to each other as to appear like a single spike.

Racemes mostly 2; blades mostly less than 5 mm. wide.....1. **I. ciliare.**
Racemes mostly 3 to 5; blades mostly more than 5 mm. wide...2. **I. guianense.**

1. Ischaemum ciliare Retz. Obs. Bot. 6: 36 [26]. 1791.

A slender much-branched perennial with creeping rooting bases, the fertile culms 30 to 60 cm. tall; blades flat, mostly less than 10 cm. long and 5 mm. wide; racemes usually 2, 3 to 5 cm. long, green, finally spreading; first glumes broadly winged at the summit.

RANGE: Wet grassland, introduced. A native of southeastern Asia.

SPECIMENS FROM BRITISH GUIANA: Bartica, dike near wharf, *Hitchcock* 17163. Hills Estate, near Bartica, a weed in old field, *Hitchcock* 17189. Wismar, sandy soil, *Hitchcock* 17281. Akyma, wet grassland, *Hitchcock* 17434.

2. Ischaemum guianense Kunth; Hack. in DC. Monogr. Phan. 6: 235. 1889.

A rather stout perennial as much as 1 meter tall, the blades often more than 10 cm. long and usually more than 5 mm. wide; racemes usually 3 to 5, ascending or appressed, brown; first glume narrowed at the summit, not winged.

RANGE: Open ground, apparently confined to the Guianas. Originally described from French Guiana.

SPECIMENS FROM BRITISH GUIANA: Southeast of Lama Stop-off, dike along canal, *Hitchcock* 16964. Mt. Roraima, "our house," *Im Thurn* 260. Kaieteur Savanna, Potaro River, *Jenman* 844*, Potaro River, *Jenman* 915. Horeabea Savanna, *Jenman* 3746*. Lama Savanna. *Jenman* 5976*.

2a. Ischaemum guianense schomburgkii Hack. in DC. Monogr. Phan. 6: 236. 1889.

Differs in having narrower scaberulous spikelets. Known only from the single collection cited.

SPECIMEN FROM BRITISH GUIANA: Without locality, *Schomburgk* 769.

60. TRIPSACUM L.

Spikelets unisexual; pistillate spikelets solitary, imbedded in the joints of a thickened cartilaginous articulate rachis, the indurate first glume covering the recess in the rachis, the joints readily separating at maturity; staminate spikelets in pairs at the joints of the continuous upper segment of the same rachis, this falling as a whole after anthesis. Stout perennials.

1. **Tripsacum latifolium** Hitchc. Bot. Gaz. 41: 294. 1906.

A robust perennial 2 to 3 meters tall, with broad flat blades, 2 to 3 cm. wide, and several spikes in a fascicle.

RANGE: Savannas, Guatemala to Guiana. Originally described from Guatemala.

SPECIMEN FROM BRITISH GUIANA: Orealla, Courantyne River, *Jenman* 217*.

61. COIX L.

Spikelets unisexual; pistillate spikelets 2 or 3 together, 1 fertile and 1 or 2 rudimentary, inclosed in a bony beadlike involucre (morphologically a subtending leaf sheath); staminate spikelets approximate in 3's (the third sometimes obsolete) on a slender rachis forming a short raceme, the rachis protruding from the orifice of the involucre, these ultimate inflorescences borne on the ends of numerous branches. Broad-leaved perennials.

1. **Coix lacryma-jobi** L. Sp. Pl. 972. 1753. JOBS-TEARS.

Freely branching, 1 meter or more tall, the cordate clasping blades 2 to 3 cm. broad, the "beads" 8 to 10 mm. long.

RANGE: Moist ground and waste places, especially near dwellings, throughout tropical America, cultivated as an ornamental and for the ivory or grayish beads; often escaped. Originally described from the East Indies.

SPECIMENS FROM BRITISH GUIANA: Georgetown, Peters Hall, along canal, *Hitchcock* 16668. Demerara River, *Jenman* 4214. Coast region, naturalized, *Jenman* in 1888.

While this paper was in press there were received the two following additional species, one of which is new:

Pariana gleasoni Hitchc., sp. nov.

Plants perennial, the leaves and inflorescence borne on separate culms; sterile culms mostly one or two, 30 to 50 cm. tall, erect, glabrous, naked below, bearing one or two leaves at the summit, the middle internode elongate; sheaths glabrous, the lower short ones bladeless, the middle ones with a reduced blade 5 to 15 mm. long, elongate, the throat mostly without bristles, the upper one or two 4 to 6 cm. long, the throat bearing a few stiff bristles; ligule firm, about 1 mm. long; blades firm and flat, elliptic or oblong-elliptic, 18 to 30 cm. long, 5 to 8 cm. wide, slightly unequal at base, rather abruptly narrowed into a petiole 1 to 3 mm. long, the apex gradually narrowed to a sharp point, glabrous except at the scaberulous tip; fertile culms 1 or 2, about 20 cm. tall, bearing a few short bladeless sheaths at base and 2 longer, somewhat inflated ones above, these with blades reduced to narrow points about 5 mm. long, all glabrous and striate; spike 4 to 7 cm. long, purplish; spikelets in groups of 6 at each joint of the articulate rachis, 5 staminate in the outer whorl and one perfect within, all falling together at maturity, the group about 1 cm. long; rachis joint glabrous, terete, shorter than the group of spikelets, curved out-

ward at base within the circle of spikelets, enlarged above into a circular disk, the base of the group top-shaped, hard and smooth, less than 1 mm. long, with 5 ridges joining the space or sinus between the 5 outer or staminate spikelets, the pedicels of the spikelets broad and flat, about 3 mm. long, short-pilose below, glabrate above, nerved, ciliate, one pair coalesced; glumes decussate on the pedicels standing outside or in front of the lemma, broad at base but narrowed to a sharp point, mostly one-third to one-half as long as the lemma, 1 or 2-nerved, glabrous; lemma elliptic, depressed and flat on the back, glabrous, about 6 mm. long, about 2.5 mm. wide, purplish, bearing 2 faint flexuous anastomosing lines near the acutish apex, incurved at the margins around the palea, 3-nerved, the lateral nerves near the edge; stamens several, the anthers 3 mm. long; fertile spikelets perfect, sessile within the whorl of staminate spikelets and within the curve of the rachis, about 6 mm. long, plump, the glumes, lemma, and palea about the same length; glumes 1-nerved, thin, broad and overlapping, inclosing the floret; lemma and palea firm, the lemma 3-nerved, the palea 2-nerved, about as broad as the lemma; the terminal spikelet perfect, solitary, sessile, the glumes 3 to 5-nerved, acuminate, about 7 mm. long, the lemma firm, shorter than the glumes.

Type in the U. S. National Herbarium, no. 1,064,516, collected in dense upland bush at Potaro Landing, British Guiana, June 25 to 27, 1921, by H. A. Gleason (no. 209).

This species is distinguished by the large blades, single or two approximate at the summit of the sterile culms, and by the details of the inflorescence. The staminate spikelets appear to be in a whorl of 5, rather than in opposite groups.

Like other species of the genus this grows here and there, in the rich virgin forest, rarely more than one specimen in flower at one place. Only known from specimens collected in British Guiana by Dr. Gleason, the three besides the type being Potaro Landing, *Gleason* 249; Tumatumari, *Gleason* 312, 348.

Chaetochloa poiretiana (Schult.) Hitchc. Contr. U. S. Nat. Herb. **22**: 159. 1920.

Panicum poiretianum Schult. Mant. **2**: 229. 1824.

Panicum sulcatum Bertol. Excerp. 14. 1820. Not *Panicum sulcatum* Aubl.

Culms 1 to 1.5 meters tall; blades plicate, as much as 1 meter long and 10 cm. wide; panicle narrow, erect, as much as 60 cm. long.

Santa Rosa, Pomeroon District, *J. S. De La Cruz* 994. Central Mexico to Argentina. Called gamalote in Trinidad.

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